RAILROAD GAZETTE

FRIDAY, FEBRUARY 12.

Southern Change of Gauge.

An important convention of railroad officers assembled at Atlanta, Ga., Feb. 2. It was a meeting of officers of nearly all the lines south of the Ohio and east of the Mississippi, and was called for the purpose of arranging the details of the proposed change of gauge of those roads, the object being to arrange that change in such a way as to produce the least possible friction and delay of traffic.

The following representatives of the several lines were present:

Savannah, Florida & Western: H. S. Haines, R. G. Fleming, George Riley, H. W. Reed.

Charleston & Savannah: C. S. Gadsden, J. W. Craig.

Central of Georgia: Wm. Rogers, W. W. Starr, T. D. Kline.

Nashville, Chattanooga & St. Louis: J. W. Thomas.

Georgia Railroad: J. W. Green, John S. Cook, Hamilton Wilkins. Major Green also represented the Port Royal & Augusta.

Louisville & Nashville: J. T. Hanrahan, Reuben Wells, R. Montfort.

South Carolina Railway: J. B. Peck, J. H. Averill.

Florida Railway & Navigation Co.: H. R. Duval, D. E. Maxwell.

Atlanta & West Point; Western, of Alabama, and Cincinnati, Selma & Mobile: Cecil Gabbett, J. E. Worswick, Wm. R. Mims.

East Tennessee, Virginia & Georgia: C. H. Hudson, F. K. Huger, W. H. Thomas.

Richmond & Danville: E. B. Thomas, Peyton Randolph, W. H. Green, E. Berkeley, R. D. Wade, C. M. Bolton, C. P. Hammond, T. W. Gentry.

Western North Carolina: A. B. Andrews, Frank Coxe, V. C. McBee, G. W. Gitts.

Norfolk & Western: Joseph H. Sands, Frank Huger, W. W. Coe, S. B. Haupt.

Charlotte, Columbia & Augusta; Columbia & Greenville: G. R. Talcott, Joseph H. Green, Thomas Bernard, R. Southgate.

Georgia Pacific: I. Y. Sage, J. F. Alexander, W. T. Newman.

Atlantic Coast Line: H. Walters, B. R. Dunn, J. F. Divine.

Brunswick & Western: W. R. Kline, J. N. Brown.

Columbus & Western: R. A. Bridges.

Western & Atlantic: R. A. Anderson, A. B. Bostwick, M. H. Dooly, M. L. Collier.

The meeting was organized by the appointment of Mr. H. S. Haines, General Manager of the Savannah, Florida & Western, as Chairman, and Mr. F. K. Huger as Secretary. Mr. Haines, upon taking the chair, briefly stated to the convention the object for which the meeting had been called, and recommmended that committees be appointed to take in hand and arrange the details of the work and submit reports to the convention.

At the conclusion of his address a resolution was passed authorizing the appointment of several committees, and the chairman thereupon made the following selections:

Committee on Date of Change of Gauge—E. B. Thomas, Chairman; J. T. Hanrahan, C. H. Hudson, Wm. Rogers, H. R. Duval, Henry Walters, R. G. Fleming, J. W. Thomas, J. W. Green, J. H. Sands, R. A. Anderson, J. B. Peck, Cecil Gabbett, W. R. Kline.

Committee on Transportation—J. F. Divine, Chairman; J. H. Averill, D. E. Maxwell, F. K. Huger, Peyton Randolph, A. B. Andrews, Frank Coxe, V. E. McBee, Frank Huger, C. S. Gadsden, W. W. Starr, I. Y. Sage, A. B. Bostwick, W H. Green, J. C. Gault.

Committee on Roadway—W. W. Coe, Chairman; C. P. Hammond, M. H. Dooly, William Mims, H. W. Reade, J. N. Brown, R. Monfort, Hamilton Wilkins, G. R. Talcott, C. M. Bolton, Thomas Bernard, B. R. Dunn, R. Southgate, J. T. Alexander, R. A. Bridges, J. W. Craig, E. Berkeley, B. R. Swoop.

Committee on Machinery—Reuben Wells, Chairman; F. D. Kline, R. R. Wade, S. B. Haupt, Joseph H. Greene, G. M. D. Riley, J. S. Cook, M. L. Collier, W. H. Thomas, T. W. Gentry, G. W. Gates, J. E. Worswick, W. T. Newman.

The convention then, by unanimous consent, agreed to adopt the Pennsylvania Railroad standard gauge of 4 ft. 9 in. as the new southern standard.

The meeting then adjourned until 4 p. m., giving the committees time to prepare their work. At that hour the convention reassembled and preliminary reports were submitted by several of the committees, which were read and thoroughly discussed. Several changes were suggested and the reports were recommitted, so that these changes could be properly considered and acted upon. The convention then adjourned until the next day.

SECOND DAY.

On the second day the first business in order was the consideration of the reports of committees.

J. F. Divine, Chairman of the Committee on Transportation, made a report, which was adopted. The report provided for the interchange of traffic between all lines immediately preceding the date of change of gauge and a prompt return of all foreign cars to the roads to which the cars belong.

E. B. Thomas, Chairman of the Committee appointed to name the date for the change of gauge made a report which, in a clear and concise manner, covered that subject, and which report was adopted.

The report named Monday, May 31, and Tuesday, June 1, as the days for a general change of the gauge. Upon May 31 the following railway lines will make the change: Louisville & Nashville; Nashville, Chattanooga & St. Louis; Memphis & Charleston; Alabama Great Southern; Cincinnati Southern; Cincinnati, Selma & Mobile; Montgomery & Eufaula; Southwestern; Pensacola & Atlantic, and the Florida Railway & Navigation Co. All the other main lines of railroads will change on June 1. Lateral lines may change previously or subsequently by arrangement with connecting lines.

Reuben Wells, Chairman of the Committee on Machinery, made a report fixing the charge for pressing on car wheels $3 per car and in the event that it is found necessary to turn up the axles, $5 a car. The report was adopted.

In connection with this subject the question of the proper lateral play that wheels should have was referred to a special committee instructed to prepare a report upon the matter for presentation at the adjourned meeting to be held February 16.

W. W. Coe, Chairman of the Committee on Roadway, made a full report in detail of the subject committed to his committee. The report gave all information concerning the organization of the track forces on the day of change with full instructions as to the manner in which the work would be done.

The resolution adopted at the meeting on the previous day with reference to fixing the guage at 4 ft. 9 in., was reconsidered for the purpose of making some changes.

Upon its being reconsidered, E. B. Thomas offered a resolution that 4 ft. 9 in., be the standard gauge of the roads represented in the convention, which was adopted unanimously.

He then offered another resolution, that a committee be appointed by the Chair whose duty it shall be to communicate with the leading railways that are of a 4 ft. 8½ in. and 4 ft. 9 in. gauge, and agree upon a wheel gauge which will be suitable to both guages, said committee to report at the adjourned meeting to be held in Atlanta Feb. 16. The resolution was adopted.

In compliance with the authority and objects of the resolution the Chairman appointed the following committee:

T. D. Kline, Chairman; Reuben Wells, J. F. Devine, James Mehan, R. D. Wade, G. M. D. Riley, W. H. Thomas, William Kinyon, W. T. Newman, J. S. Cook, J. E. Warwick, G. H. Gramling, S. B. Haupt and G. W. Gates.

A resolution of thanks was adopted to the proprietors of the Kimball for the gratuitous use of the parlors in which the convention was held. The convention then adjourned to meet again in Atlanta, Feb. 16 next.

The Telegraph as Applied to Train Movement.

[From a forthcoming work by J. J. Turner, Superintendent, First, Third and Fifth Divisions, Chicago, St. Louis & Pittsburgh Railroad.]

IV.

CHAPTER XVIII.—*Holding and Annulling Orders.*—Notwithstanding the theory of the duplicate order system, that whenever one train is given an order in relation to another that other is to receive a duplicate copy, it is not always practicable to do so.

Take, for example, the instance of a passenger train being delayed by a wreck, or some other cause, which makes the length of the detention a matter of doubt. The dispatcher's first duty is to move every other train against this one as far as the least probable delay to the latter will admit; and then, if it is found that the delay is to be greater than at first supposed, they can be moved again. This process may be repeated many times until what it was originally thought would be a detention of a few moments has become one of several hours.

By the time the passenger train is ready to move there will have been a great many orders issued against it, more than one-half of which may have ceased to be in effect. It would result in confusion to have them delivered to this train, and it is a waste of time to have them copied unless they are to be delivered. They are therefore issued only to the train moved against the one delayed.

Before the exact delay to the passenger train is known, care should be taken not to allow trains running against or ahead of it to leave one telegraph station unless they have ample time to make the next; otherwise, they will get out of reach and cannot be given the advantage of subsequent delays to it.

Both for keeping the passenger train under control while other trains are moved against it, and for checking other trains which might get between telegraph offices out of reach, the holding order is used.

It is simply an order addressed to an agent or operator, sent and repeated with all the usual checks, instructing them to hold the train for orders, or until certain other conditions are fulfilled.

When the conductor and engineer are accessible to a telegraph office the order should be sent to them, instructing them not to leave that or some other station without further orders. This plan relieves the agent or operator of the responsibility, keeping their minds clear for other work, and places it on the men who have charge of the train. When the delayed train is ready to move it is given an epitome of all the orders in effect against it, no mention being made of those which have become void.

The annulling order is used either for annulling a regular train or for destroying another order.

In the case of regular trains, the time-card always, in some manner, states on its face upon what days each train tabulated there is to run. It is necessary that other trains, whose movements would be affected by the presence of any train which it is desired to discontinue for the day, be notified that it is not on the road; and, as no instructions regarding the use of the track in conflict with the time-card are given except by "orders," the form has come into use.

It is worded to give the date and train that is annulled, and is sent to every one interested. The point of danger to be guarded against in its use is a mistake in the train, growing out of its date.

The date of a train is a local affair, and is usually taken from its starting point on the time-card. A train leaving a terminal "A" at 11:45 p. m., Oct. 1, and arriving at "B," the next terminal, at 11:45 p. m., Oct. 2, would be considered of Oct. 1, and so designated throughout the trip, although nearly the whole distance was made on the 2d.

In the case of annulling an order it is used in the same manner, excepting that the only persons to whom it is sent are those to whom the original order was given.

A mistake may occur in the case of persons who have received a good many orders and the wrong one be destroyed. This must be guarded against by giving the wording, or at least the effect of the order annulled.

CHAPTER XIX.—*Decreasing the Number of Trains in a Convoy.*—It frequently happens that at junction points enough cars are left, or at the summit of heavy grades trains are consolidated sufficiently, to drop one or more engines and crews out of the convoy, and return them for more cars.

The method of indicating sections has already been explained.

Where trains are dropped out, a complication arises which may cause misunderstandings unless carefully guarded against by the dispatcher.

As an illustration, we will suppose an east-and-west road, upon which east-bound trains have the preference to the track. Three trains leave the western terminal bound east, the last one with a full train for a junction midway the run. When the second arrives at the junction, an order addressed to the second and third is given it, instructing the third to run no further than that point, and the second to take down its signals. A few miles east of the junction the second, carrying no signals indicating a third, meets a west-bound train, which proceeds on the supposition that no more trains are to be expected until the next number is due. In the meantime, the third east-bound train has been delayed west of the junction; the west-bound train passes the junction without any knowledge of its existence and occupies the track at a time when this train has the right to use it.

If the first section had been the one stopping at the junction, a mistake of this kind could not be made, because what had been the second, with signals, would still carry them, and become the first east of the junction. The signals it carried would hold the west-bound train. This same effect is had when an intermediate section is dropped. The last section should never be the one stopped, if it is possible to avoid it; where it is not possible, the operator should have an order to hold for "orders" all trains whose movements would be affected.

When absolutely necessary to stop the last section, and orders are given explaining the situation, they should be carefully worded, the dispatcher bearing in mind that anything so far out of the usual manner of identifying trains is confusing to the train-crew.

Chapter XX.—*Running Regular Trains Ahead of Time.*—The time-card in its tabulation of trains says, in effect, that no train shall pass any station before the time designated in this tabulation. It is for the purpose of giving definite information as to the movement of trains that time-cards are used.

While train-orders may and do supersede the time-card instructions, yet they always give to one interested notice of the supersedure. Now every agent, every bridge carpenter and section foreman is affected by the number of trains run, and it is proper that he should be notified of such variations from the schedule; otherwise a train ahead of time may be mistaken for an extra, which the time-card bids them at all times to expect, and some important piece of work be delayed awaiting the arrival of the regular.

It is impossible to notify this class of employés of the running of a train ahead of time; therefore the practice is a poor one, contrary to the principles of train-dispatching, and should be indulged in within the narrowest limits.

Sometimes running ahead of time past one or two stations will enable a train to make some point for an opposing train, and save delay; in which case, if they cannot get more than five or eight minutes ahead of their card time, the practice is safe and permissible.

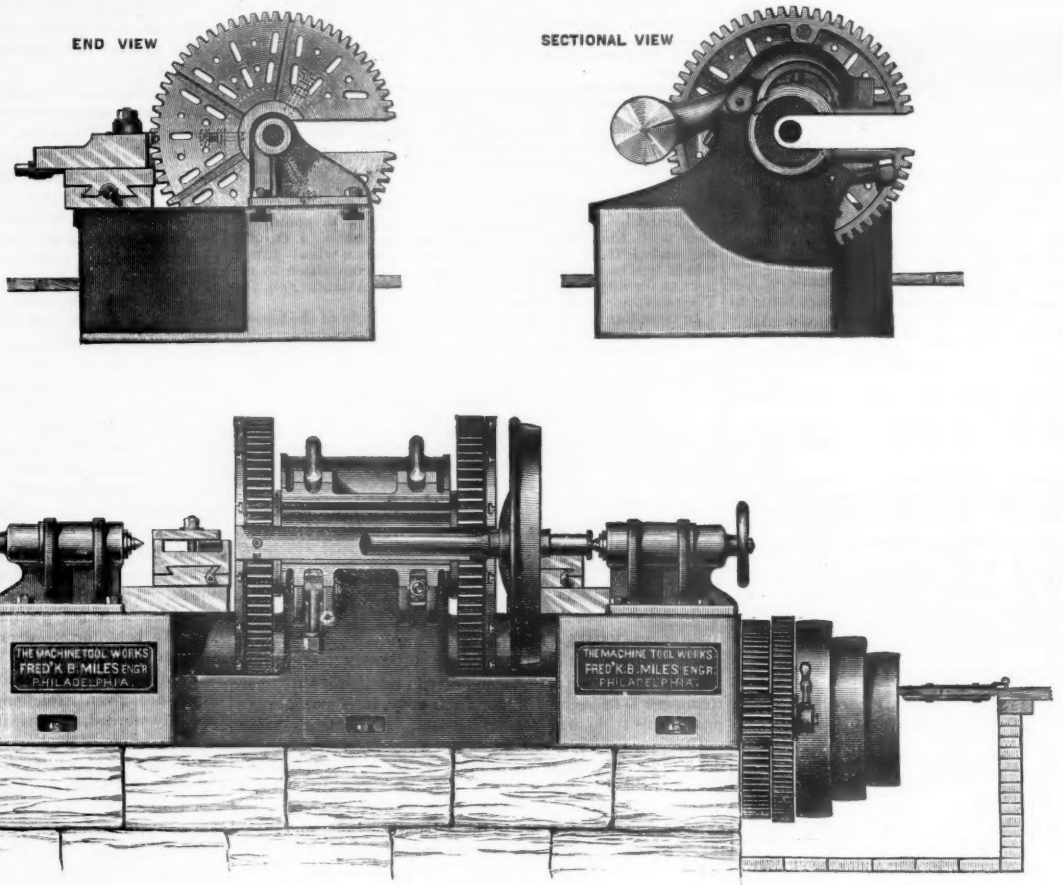
Trains which are to be run ahead of time for a long distance should be run extra, and if there is not another train to take their number, it should be annulled for the day.

CHAPTER XXI.—*The Dangers Surrounding a Change of Orders.*—After trains have been given orders in regard to other trains, it sometimes becomes necessary to change the arrangement. This requires a new order, which may be received by one of the trains interested sometime in advance of its receipt by the other; in the meantime, one train is running under the new and one under the old order, and great care must be taken that both are not thereby given the right to the same piece of track.

An illustration of the case in point occurred as follows: Upon a north-and-south railroad where the trains northward-bound had the indefinite right to the road, there was a rule that the last order regarding any train superseded all others. W, X, Y, and Z were four way-stations; X 12 miles south of W, Y 10 miles south of X, and Z 10 miles south of Y. About 8 o'clock the track was obstructed near X, and No. 15, a freight south, was run to X regardless of No. 14, north. The order being put out to No. 5, at W, and to No. 14 at Y. At 11:30 No. 15 arrived at X, and reported the obstruction clear and the train ready to go. No. 14 not yet having reached Z, an order was sent to No. 14 at Z, and to No. 15 at X, giving No. 15 until 1:10 to run to Y for No. 14. No. 15 got the last order about 11:35, and proceeded on it. No. 14 got it about 11:30, and went to Y, arriving there about 12:30, at which time they were given the first order issued, stating that No. 15 would run to X regardless of them; without noticing that the last order received was the first one sent, as shown by its number, the conductor and engineer interpreting the rule that the last one which they received destroyed all previous orders in relation to No. 15, proceeded north of Y on the right conferred by time-card to run without regard to No. 15, expecting, however, to wait at X until it arrived, according to the provisions of the first order issued, but the last received by them. No. 15 meanwhile running from X to Y under the last order issued, the two meet between these stations.

If a rule had been incorporated in the instructions for running trains by orders, by which all orders would remain in force until fulfilled or destroyed, this mistake would not have happened. But even with a regulation of this kind a somewhat similar mistake was once made.

The circumstances were these: A, B, C and D were four stations; A the terminal, B 10 miles, C 18 miles, and D 28



MILES' DOUBLE WHEEL-TURNING MACHINE.

Built by BEMENT, MILES & Co., *Philadelphia, Pa.*

miles west of A. The east-bound trains had the preference of the track.

An east-bound train at D and a west-bound train at A, received orders to meet at C. When the east-bound train arrived at C, the west-bound train was not at B, and a new order was sent to C and B, saying that the first order was annulled and that the east-bound train would run to B regardless of the west-bound train.

This destroyed the first order to the east-bound train, and would have done also to the west-bound train, had it arrived at B in time to get it. Upon the arrival of the east-bound train at B, its only order left in force against the west-bound train was the one received at C, and it had been fulfilled. The train proceeded by time-card, or without regard to the other train, while this other, under the order first given, was running without regard to it.

If the second order issued had made a positive meeting point between the two trains at B, the east-bound train could not have passed there, and there would have been no danger of a collision.

Here was a case where orders were properly issued, and yet a collision made possible between the two trains running under them, merely through a misapprehension of the effect of the change. In making changes care must always be taken not to change the relationship of the two trains, excepting between the two stations at which the new order is placed for delivery, so that if either of them, running on the new order, gets as far as the point where the other is to receive it, it cannot pass beyond excepting under the same understanding of its relationship to the opposing train as that train has.

CHAPTER XXII.—*Orders for the use of double as single track.*—On double-track roads it frequently occurs that one track is obstructed, leaving the other clear for the passage of trains.

Without the interposition of the dispatcher, trains going in the direction assigned to the unobstructed track would proceed as usual, while trains in the other direction would be held until their track was clear.

To prevent this delay, orders are issued by which the unobstructed track is used for trains in both directions, or as a single-track road.

It is sometimes only considered necessary to issue an order to all trains in each direction, directing them to use the north or south-bound track between two points named as single track for a certain length of time, or until further orders. This would, ordinarily, seem to be all that would be required of a dispatcher, excepting, of course, the moving of inferior against delayed superior trains over this track; but there are in this case, as in all others involving train movement, other considerations besides the mere issuing of orders which are in themselves correct. The capacity of the men to understand and carry out instructions must always be borne in mind.

On roads which are double-track for their full length, men form the habit of considering only the trains using the same track as they themselves do, and neglecting the trains on the opposite track, with which they are extremely unlikely to have dealings.

One of these men, brought up to a temporary gauntlet of single track, without notice of its existence, will be completely at sea, and it will take him several moments, numerous consultations with his time-card and explanations from the operator, as to which trains have and which have not passed in the opposite direction, before he feels safe to move his train; and, when he does move it, the probabilities are that he is proceeding, not on his own knowledge, but on the word of another man.

The best way to move trains through a gauntlet of this kind is to extend it between two telegraph stations, even though it is possible to make it much shorter. Prohibit the operators to allow any trains to enter without orders. The dispatcher can then move the trains by absolute orders, entirely regardless of the time-card and other trains, reading something as follows: "Run on south-bound track from 'A' to 'B' regardless of all trains." The danger from oversight by trainmen is entirely eliminated by this plan, and it devolves upon the dispatcher to see that no two trains in opposite directions are put upon the gauntlet at the same time. This is especially important, as on double track nearly all freight trains are run as extras.

If this plan cannot be adopted, trains should have notice of the existence of the temporary single track as far away from it as possible, to enable them to collect their wits and observe trains passing on the other track.

CHAPTER XXIII.—*Block Signals.*—Collision by trains running in opposite directions coming in contact are very rare, while the records of each month show a large number caused by trains running into the rear of others, going in the same direction.

The cause for this is easily seen when it is remembered that whether trains are running by the time-card rules or by "orders," two proceeding in different directions, having met, widen the distance between them at every moment; while in the case of trains running in the same direction, the first, having passed any point, is no longer entitled to the track there, the right succeeds to the next, which immediately follows.

It is customary to have a provision incorporated in the rules that no trains shall follow a passenger train within ten, nor a freight within three minutes; but by reason of a possible delay to the one preceding, this does not entirely obviate the difficulty.

Of course, it is made obligatory on trainmen to send a man back to protect the train whenever a stop is made on the main track, and elaborate directions are given as to distance and the placing of signals, but the very short delays are so much more frequent than the long ones that the men become careless and inattentive.

The block signal is an evolution from this experience, and it is used not as a substitute but as an auxiliary to the man who protects the rear of trains. Under it, telegraph offices supplied with fixed signals, like or similar to the train-order signal heretofore described, are placed along the road at distances varying with the number of trains passing daily. The road between these stations is termed a block, and the stations themselves block stations.

The system is used almost exclusively on double-track roads, and as it is intended to lessen the probability of collisions from the rear, it is usually applied only to trains in the same direction.

A passenger train having passed one of these stations, no other train is allowed into the block until the passenger has passed the next station. A succeeding train then receives a clear signal, which indicates that there is no train ahead of it in the block. A freight train having passed into the block, trains following are held for a stated time, three or five minutes, when they are allowed to proceed, but under a caution signal, which indicates that the block is occupied by another train.

These movements are governed by the operators at the block stations, acting under general instructions, from which they are not allowed to deviate without an "order" from the train dispatcher.

With notice of this kind, men on succeeding trains are apprized of the position of those preceding, and are enabled to act more intelligently; and while it in nowise releases the men in charge of trains of the responsibility of protecting themselves by the usual signals, a double safeguard is is erected.

This system is termed the "Permissive Block."

The "Positive Block" holds back trains following freight, as well as those following passenger trains, until the preceding train has passed out, so that positively no two trains are allowed in the block at the same time.

There are some places at which the block system is applied to single track. By it the operator at any station, upon the approach of a train, inquires of the next station beyond in the direction in which the approaching train is proceeding, for the number of the last train passing there bound in the opposite direction; and if it has not passed his station the approaching train is held for its arrival.

These systems have no reference to the rights of the road, and the safety signal displayed at a block station confers no authority to proceed to a train which, under the time-card, should await the arrival of another.

Miles' Double Wheel-Turning Machine.

In order to realize the utmost amount of favorable service from railroad wheels, it is necessary to provide an economical method of restoring their correct form without removing them from their axles, whenever they become worn too much out of shape by the combined effect of the rails and the brakes. For these purposes the three different processes of milling, grinding and turning have each been employed. The milling process has proved as yet too slow and expensive, but the grinding process, after much experimenting, has finally been successfully used on many roads, to true chilled iron wheels; while for those with steel tires, which are coming more and more into use, the turning process has been found the most convenient and satisfactory. In the evolution of the turning process, two distinct types have been developed of machines best adapted for quickly and accurately turning steel-tired wheels on their axles. The first of these is now familiarly known as the "double driving-wheel lathe," which was patented by Joseph Beattie, an English locomotive superintendent, about 1847, and was first made

by Whitworth, of Manchester, and is in daily use in railroad shops for turning locomotive driving-wheels.

This first model or type, so familar to all railroad men, has two headstocks, one at each end of the bed, each headstock having a heav y spindle fitted with steel centre and carrying a geared face-plate, by which it is driven. The wheels and axles which are to be turned, are placed between these face-plates, the axles being supported on the spindle centres in the usual way, while the wheels are revolved by drivers on the face-plates.

As steel-tired car wheels came more and more into use, lathes after this model were made for turning them, but are open to the objection that in taking a deep cut, considerable torsion is thrown on the axle, unless the driving shaft connecting the two face-plates be made very stiff and of considerable weight and diameter. Unless this point is carefully attended to, one face-plate is practically driven through the axle, which is consequently overstrained and twisted, while the work produced is not smooth, owing to the chattering of the tool produced by the axle springing.

Attempts were made to overcome this by arrangements for gripping the axle journal in chucks or bearings, but this only partly solved the difficulty, owing partly to the liability that the wear of the journals might throw the wheels out of true, but principally because there was still too much spring in the axle; for it was evident that there was more chance for spring in the 4½ ft. of axle between the wheels, than in the 10 in. outside of the wheels. It then occurred to Mr. Nathan Washburn, of Boston, to revive a patent of White, of Rochester, N. Y., and acting upon this idea he produced a lathe for turning car wheels, in which the usual construction was reversed; the face-plates instead of being *outside* the wheels, were placed *between* them, and so arranged as to support in a thoroughly rigid manner the portion of the axle between the wheels, while the end journals were carried upon dead centres in massive tailstocks. This is the second form or type, and is the kind of machine shown in our illustration. The first lathe made on this model by Mr. Washburn was found at once to possess great advantages in stiffness and efficacy. A way now seemed open to solve the difficulty of quickly turning steel car wheels on their axles.

In the machine before us, Messrs. Bement, Miles & Co., of Philadelphia, have gone still further than Messrs. White and Washburn, in the same direction. By the addition of some improvements of their own, they have succeeded in producing a machine in which the time occupied in turning wheels seems to be reduced to a minimum.

The first machine of this kind made by Messrs. Bement, Miles & Co. has been already illustrated in these pages,* but as further improvements in details have been introduced during the last twelve months, we believe our readers will be interested in the latest developments of this method of turning steel-tired car wheels, even at the risk of some unavoidable repetition of what has already appeared in the *Railroad Gazette*.

The construction of the machine may be described as follows:

The bed is a box casting of irregular outline, whose upper surface is as little as possible below the centres, allowing only room for sufficient thickness of tool slides. The ends of the bed are planed to receive the tailstocks, and in the centre is an enormous journal bearing, cast, for greater solidity, in one piece with the bed itself. This is fitted with a massive hinged cap, which is counterweighted that it may be quickly and easily opened when necessary. When closed it is held firmly by two large bolts, which are swung upon pivots for easy adjustment. This large bearing supports the huge main spindle of cast-iron, which carries the two face-plates, one upon each end of it. A gap is cast in the face-plates and spindle which extends to the centre, forming a hollow way into which, when set horizontally (the hinged cap being raised), the wheels and axles can be freely rolled on a level. Near each end of this main spindle, inside the face-plates, are three 1½-in. steel set-screws, grasping the axle firmly close inside the wheels. The gaps in the face-plates serve also for the drivers, which are specially designed for this work, being quickly and conveniently applicable to any kind of wheels in use. These gaps are not bridged by having pieces inserted in the gears, but each face-plate is driven at two separate points on its circumference, so that while one gear is passing the gap, the other will be fully engaged, and *vice versa*. The arrangement of the gearing is such, and the solidity of the lathe so great, that even when taking the heaviest cuts there is not the slightest sound or movement to indicate the time when the gaps are passing the gears. The face-plates and wheels swing in recesses, which are formed in the bed, and are open to the front of the lathe to admit of the wheels being rolled in and out, but closed at the back, where the top of the bed is planed out to receive the tool slides.

The tailstocks are made of such shape that the tool slides can be moved up close to the journals for the purpose of turning them whenever it may be thought desirable to do so. If then it is preferred to turn the wheels on their own journals, the lathe is so arranged that proper bearings can be readily applied to them without any other delay than that required for the necessary adjustment of the boxes. But experience has shown that the steadiness afforded by the tailstock centres and the set-screws in the main spindle, which support the axle solidly at four points in its length, is amply sufficient to withstand even the heavy cuts this machine is capable of taking.

The method of operating it is as follows:

The gap in the face-plates being placed horizontally, and the hinged cap opened, the wheels, on the axle, can be rolled freely into the lathe on skids arranged at the proper height to bring the centre of the axle just a little below the level of the tailstock centres. These are then screwed up solidly, lifting the wheels just clear of the skids. The hinged cap should then be closed and secured by the two pivoted bolts, next the drivers applied, tightly screwed up to prevent slipping, and finally the large set-screws in the main spindle set up, with equal pressure as near as may be on each. The lathe is then ready for cutting. The tools used are flat steel plates 1½ in. thick, shaped to the tread of the wheels, one part forming the flange, another the tread, another, if needed, the chamfer—all fitting tightly beside each other in the tool-box. By this method, if one part should give out, it can be easily replaced by a new one, and reground. The taper or cone of the wheels should be formed on the tools, so that the tool slides may be set square with the bed and at the proper distance apart by the track gauge. The tools can then be moved straight in until the wheels are reduced to the proper diameter, when they may be withdrawn in readiness for another pair. By this means the time and trouble of applying the track gauge to each pair of wheels is saved, and the proper gauge is preserved without re-measuring. For further convenience, when the tool slides are once located properly for the gauge, they should be carefully marked in order that they may be correctly replaced at any time after being moved. Another saving is effected by a calipering attachment, not shown in the cut, which serves to ascertain the diameters of the wheels at any moment while they are being turned, and thus dispenses with the need of stopping and applying the band gauge or caliper.

The great difficulty in this method of turning wheels was supposed to be the peculiar hard spots in the tread, caused by the friction of the brake shoes, or by sliding on the rail. In practice, however, this difficulty is overcome as follows:

In beginning to turn a pair of partly used wheels, as the tread is generally worn hollow and slightly eccentric, the tools in most cases take hold first on the soft part of the tire that is outside the rail, and cut only on one side. As the cut deepens it spreads around the wheel and also over the tread toward the flange. Widening gradually in this way, should any hard spots make their appearance—as frequently happens—the tool polishes the edges of the spots before striking them in a way to nick its own edge. The operator is thus enabled to detect the hard spots and chip them out before they can injure the tools. In the case, however, of unusually hard wheels, which may occasionally have to be turned, some plain straight tools could be employed for roughing them. There is also another device in the shape of a change of speed of the counter, to which the operator can resort upon meeting a hard place or a hard wheel, and by a single movement of the belt-shifter instantly reduce the normal speed of the cut to a rate at which a steel tool will cut chilled cast iron.

The driving gear is arranged with two cone speeds, the faster correctly adapted for 33-in. and the slower for 42-in. wheels, each speed having its corresponding reduction for hard places, as explained, by means of the change of counter speed. This gives four changes with the back gear in. When it is desired to turn the journals, the back gear can be thrown out to allow of a faster motion, which is suitable for the diameter of the journals. The automatic feed motion is arranged to be applied when desired for turning both tires and journals.

The power and steadiness of this lathe are so great that it has been known to turn a pair of 42-in. Allen paper wheels in one hour, counting the time of putting them into the lathe and taking them out again. This performance was witnessed on several occasions by numerous master mechanics, master car-builders and others. Some idea may be formed of the action of the machine when it is stated that the finishing cuts extended over the faces and flanges of both wheels, measuring 14 in. in all of steel cutting, and that there was no chatter or vibration. The builders are ready to repeat this test whenever required. They are fully satisfied that, with proper arrangements, an average of at least six or seven pairs of wheels should be obtained per day from one of these machines.

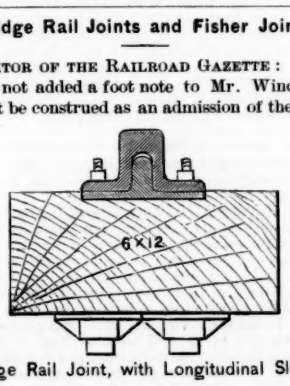
* See *Railroad Gazette*, Feb. 27, 1885.

Contributions.

Bridge Rail Joints and Fisher Joints.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Have you not added a foot note to Mr. Winchell's paper which might be construed as an admission of the principle of the Fisher bridge joint as the only correct one? The rail he represents is, as you say, the old Brunel, more familiarly called the U rail, many of which may still be seen in side tracks of some of the old roads in this country. The joint is identical in principle with the Fisher bridge joint, all the load being taken vertically and direct both inside the head and base, the horizontal bolts serving only to keep in place the different parts of rail ends and bridge piece. Yet you say, "Both rail and joint are still in use to a considerable exten, and give perhaps the most perfectly riding track in the world the joint being almost imperceptible." CLARK FISHER.



Bridge Rail Joint, with Longitudinal Sleeper.

Bridge Rail Joint used in Ireland.

[Barry's "Railway Appliances" says:

"An objection which is often urged against the bridge rail is that there is a difficulty in uniting two rails endways in as satisfactory a way as is done by the fish-plates and bolts of the other two forms of rail. The ordinary fish-plates are not suited to the bridge rail, but there cannot be any difficulty in designing an efficient mode of junction, and probably the reason why it has not yet been carried out is that with the longitudinal sleepers the joints are not so weak as with the cross-sleepers and the necessity of a better fastening than is now adopted has not been found imperative. The fastenings usually adopted for the ends of the bridge rail are shown in fig. 38, but they are manifestly inferior to the fish-plate.

"In Ireland, where the bridge rail was used on cross sleepers, the rail was made nearly as high as an ordinary double-headed rail, and weighed 92 lbs. per yard. In that case a joint was devised, as shown in fig. 39. A centre rib is placed in the hollow of the rail, and the rib is supported and tightened up by two wedge-shaped clips, which are pulled together by cross-bolts."

As for the merits and working the last named joint we are not advised. It would seem to be a poor and weak device. But in saying that the original Great Western joints are "manifestly inferior to the fish-plate" the author goes a long way beyond the facts, if the "manifest" inferiority is assumed to be supported by experience, the fact being that the track obtained by those joints and the longitudinal sleepers together is, by general admission, about the smoothest riding track in England and conspicuously so in the noiselessness and smoothness of the joints. If a statement of this undoubted fact be an "admission of the principle of the Fisher joint as *the only correct" one* we are pleased to be able to make it. It certainly does not tend to disprove it.—EDITOR RAILROAD GAZETTE.]

The Locomotive "Kitchigami."

TO THE EDITOR OF THE RAILROAD GAZETTE:

My attention has been called to a recent article on the locomotive "Kitchigami" published in the *Railroad Gazette*.

Will you kindly state, in order to "give honor where honor is due," that the specifications for the "Kitchigami" were prepared by Mr. L. S. Woodbury, Second Assistant Superintendent of the Calumet & Hecla Co., to whom, with the Baldwin Locomotive Works, all credit and responsibility for the engine belongs. E. D. LEAVITT, JR.,

Consulting Engineer, Calumet & Hecla Mining Co.

Rail-joints and Steel Rails.

[Paper read before the British Institution of Civil Engineers by Mr. C. P. Sandberg.]

PART I.—RAIL-JOINTS.

The reason for this paper is to be found in the news recently received from America that fish-plates break frequently, and that steel rails wear badly.*

The most curious fact is that the angle fish-plates do not break through the bolt-holes, but right in the middle where the rails are joined, and not from the bottom, but from the upper edge. This seems to indicate that one of the joint-sleepers must have sunk, so as to put the upper part of the fish in a state of tension instead of compression. As a remedy, some railway administrations have actually increased the length of the angle fish-plates to 44 in. so as to cover three sleepers, of which one is directly under the rail-joint; which means that they have both supported and suspended joints. [For more than 20 years rails and rail-joints have been a specialty with the author in connection with the supervision and inspection of large rail-contracts, for America, as well as of observation of the wear of rails and rail-joints on the railways of Europe. The rails which have been found to wear badly in America are principally of American manufacture, and the fish-plates are also exclusively of American make. This paper will be confined to a statement of observations in Europe. This may lead to an explanation of the phenomena observed in America, while at the same time it may serve as a warning to European railway-managers to avoid the errors committed elsewhere.

OLD RAIL-JOINTS.

Finding the plain fish-plates too weak, not so much through breakage as through the sinking of the joint and the flattening of the rail-ends, the author, in 1865, began a great number of experiments in order to ascertain the comparative stiffness of rails and rail-joints. The results were published in the *Journal* of the Iron & Steel Institute, and in several engineering papers on this side of the Atlantic.

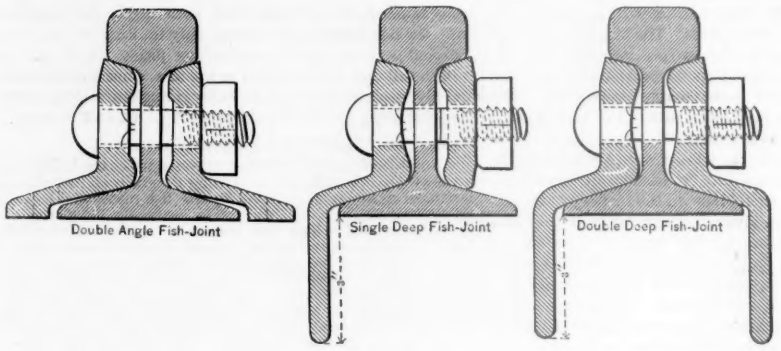
The first suggestion, with a view of strengthening the rail-joint, was to do away with the pear-shaped rail-head in order to obtain a reversible fish-plate of smaller fishing-angle, so as to throw less work upon the bolts, in order that they might not work loose.

In the first series of "Standard Rail-Sections," published in 1870, this angle was fixed at 22°. But as experience proved that there was some difficulty in rolling rails to this angle, it was increased to 30° in the second series of standard sections for steel rails, published in 1878. The old pear-shaped form had, however, double this angle, or 60°. Several million tons have been rolled to the author's standard sections, mostly of 50 and 56 lbs. weight per yard; and the largest proportion has been sent to America.

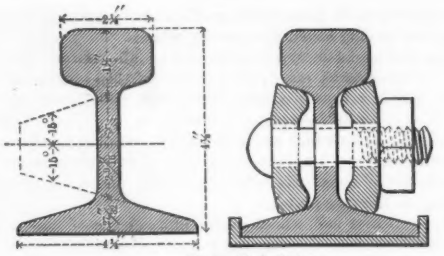
The next thing was to abolish the notching of steel rails in the flanges, except in the corner of the rail-end, and to drill the bolt-holes instead of punching them.

About this time the use of suspended instead of supported joints was introduced, in consequence of the flattening of the rail-ends. The author did not advocate this mode of remedy, as is proved by a statement in the pamphlet just referred to, which says "It was a poor way to strengthen the weak point of the line (the rail-joint), by taking away the support under it." There was, however, no help at the time, and seeing that the suspended joint would be generally introduced, efforts were directed to securing, if possible,

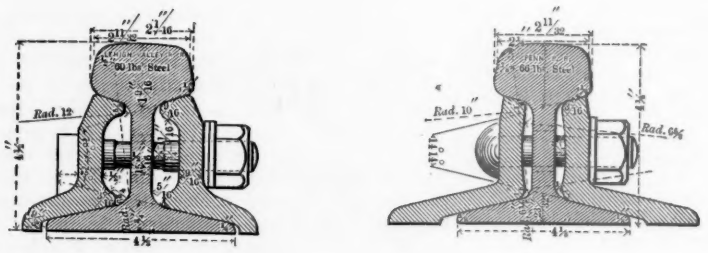
*See numerous articles, reports and correspondence in the *Railroad Gazette* during the year 1885.

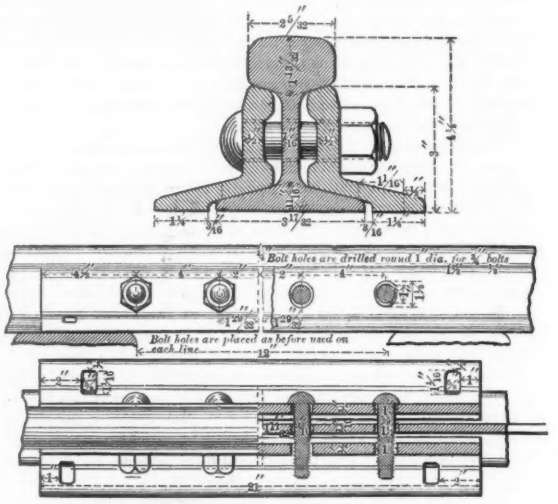


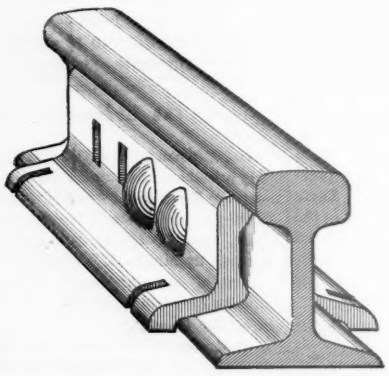
Angle Fish-Joints.



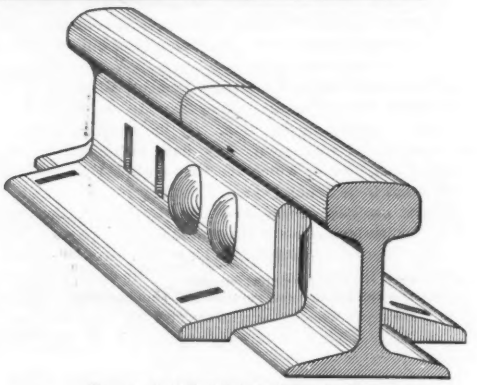
Plain Fish-Joint.



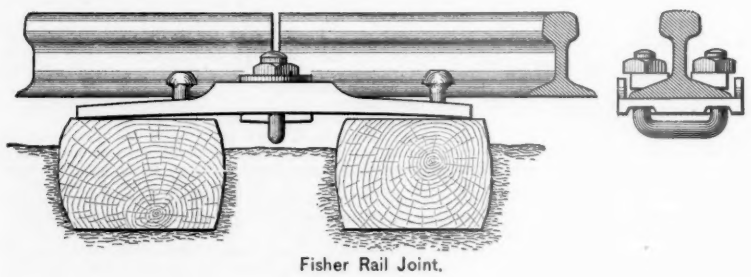




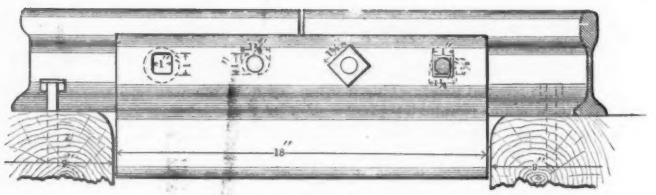
Rail-Joints with Slots for Spikes, Used in America.



Suspended Rail-Joints Used in Sweden.



Fisher Rail Joint.



Deep Fish Joint.

equal stiffness of the joint, as of the solid rail, through the use of stronger fish-plates.

MODERN RAIL-JOINTS.

It was soon found that the joint with plain fishes would not carry more than say, on an average, one-third of the load carried by the solid rail before taking permanent set, the distance of supports being the same as generally obtained. Different shapes of fish-plates were therefore examined, with the view of determining which would give most stiffness, and out of the great variety of shapes a selection of two distinct sorts, the angular and the deep form, was made.

The angular shape projected only to the rail-base, but offered a much wider base, extending horizontally so that the slot, or holes for the spikes, would fix it to the joint-sleepers, and thus prevent the creeping of the rail longitudinally. The deep fish projected vertically under the rail-base 2 or 3 in., thus preventing the travel of the rail by the fish butting against the sleepers. In both instances the rail-flanges could be left without any notches.

In 1876 the author suggested that the administration of the Swedish government railways should undertake some comparative experiments with these two kinds of fish-plates, on a tolerably large scale, on their lines, so as to ascertain which of the two forms would be the better to adopt. The plain joint then in use, both supported and suspended, had resulted in flattening of the rail-ends, long before the rails were worn out, so that many thousand tons had to be taken up and reduced in length by cutting off one foot at each end, and fresh bolt-holes had to be drilled in order to relay the rails, and get their full wear out of them. This proposition was acted upon by the administration, who not only ordered one thousand pairs of each of the two kinds of fishes, but, in addition, got another joint designed by the Chief Engineer of the Permanent Way, Mr. Elworth. This consisted of an iron bridge-plate, with flanges on both upper sides bearing on the two joint sleepers, something like the Fisher joint in in America, but in conjunction with ordinary plain fish-plates on the sides of the rails as usual.

As the sudden replacement of plain fishes by either angle or deep fishes on so extensive a system as the Swedish State railways would be very expensive, it was proposed to carry out the exchange gradually, by applying at first only one new fish plate on the outside. With this view different joints were tested, viz., one plain, with one angle, or one deep or one plain on either side, and the result is shown in the table kindly furnished by Mr. Elworth, which is all the more valuable, inasmuch as the information has not hitherto been published anywhere. The author had frequent opportunities of examining the line with these experimental rail-joints, and can testify that each of them had perfectly fair play, there being no pre-disposition for or against any one of them, but only a single aim, namely, to arrive at the best and cheapest rail-joint. The table shows that the bridge-plate joint gave the least number of flattened rail-ends; next to that the angle fish, and lastly the deep fish-plates; it shows also that the plain, in conjunction with the deep and the angle fish, gave the worst results. Notwithstanding that the bridge-plate joint with ordinary fishes gave the best result, as having less flattened rail-ends and fewer sunken joints, it was considered too expensive for adoption.

The deep fish, although giving the stiffest joint, a joint fully as stiff, indeed, as the rail itself, was somewhat disliked by the platelayers and trackmen, in consequence of the severe Swedish climate; snow and ice covering the line for say half the year.

The angle fish applied on both sides of the rail-joint obtained much favor with the platelayers, but though it became the favorite, yet for economical reasons the exchange has been only gradually effected, one angle fish-plate being applied on the outside, and one plain on the inside. This has been gradually accomplished, so that the whole of the Swedish State railways, about 2,000 miles in length, are now laid with this rail-joint. In future, however, angle fish-plates are to be applied on both sides of the rail-joint as fast as the plain one wear out, and the iron rails are changed for steel rails.

Many of the private lines in Sweden are also laid partly with one angle and one plain, and partly with two angle fish-plates, and up to the present time with satisfactory results.

In Denmark, in 1876, the author's suggestion was adopted on the Sjelland State Railway between Corsor and Copenhagen, and angle fish-plates provided on both sides the rail, and the whole line is now laid in this way. Thus, in Denmark also, the result of several years' experience has been satisfactory; there has been no breakage of fish-plates, no sunken joints and no creep of the rails.

In Germany angular fish-plates have long been in use, both for ordinary wooden sleepers and in connection with the iron or steel sleepers now generally used there; but they differ from the author's sections. The latter afford contact all along the upper part of the rail-flange, while the German type only affords equal contact between rail-flange and fish as between rail-head and fish, so there is less probability of

RESULTS OF EXPERIMENTS WITH DIFFERENT FISH-PLATES ON THE SWEDISH STATE LINES.

The following seven different kinds of rail-joints were laid in 1876.

Year when the rails had to be taken up for flattened ends. Iron rails 63 lbs. per yard.....	Elworth's bridge plate or channel iron, with plain fishes...	Angle Fish-plates. On both sides of the rail joint.....	Angle Fish-plates. On the inside, with a plain fish on the outside of the rail-joint.....	Angle Fish-plates. On the outside, with a plain fish on the inside of the rail-joint.....	Deep Fish-plates. On both sides of the rail-joint	Deep Fish-plates. On the inside, and a plain fish on the out side of the rail-joint..	Deep Fish-plates. On the outside, and a plain fish on the inside of the rail-joint ...
	P. c.	P. c.	P. c.	P. c.	P. c.	P. c.	P. c.
1879	0.8	1.6	3.2	2.4	1.6	1.6	3.2
1880	2.0	4.8	7.2	11.2	11.2	16.0	11.2
1881.	3.6	8.0	9.6	16.0	4.8	4.8	8.0
Total of the five years' wear, flattened rails at the ends in per cent. of laid rails	6.4	14.4	20.0	29.6	17.6	22.4	22.4

bolts keeping tight, although there is equal strain on the bolt on the upper and lower side. Judging of the comparative merits of these systems from the number of loose rail-joints in the respective countries, the author claims that the Scandinavian type of joint is decidedly the best.

At the Antwerp Exhibition of 1885 the author's rail-joint for 50-lbs. rail was exhibited, and also the one for 63-lbs. rail, made for Denmark, with fishes 26 in. long, and they are favorably spoken of in the Report of the Belgian State railways. The angle-fishes have thus far shown no signs of failure in Europe, similar to those reported from America; but from their general adoption, say, during the last ten years, it is clear they have been regarded in the United States as an improvement on the old plain fish-plates. It is true they offer only two-thirds of the stiffness of the solid rail, and the

joint sleepers have therefore to be lifted now and then; but the increased stiffness of two-thirds, as compared with one-third of the value formerly attained with plain fishes, is a decided improvement. Again the large base which they offer at the joint sleepers and the four spikes holding the rails to gauge, are features which cause them to be liked by engineers.

Some lines in Germany have adopted the deep fish-plate with even better results than the angle, so far as stiffness is concerned, for the line may have with the deep fishes the same stiffness at the joints as in the solid rail.

In France flange rails are used, but they are generally of heavier weight than in Germany, say 70 to 80 lbs. per yard. Generally plain fish-plates are employed, and joints are laid on the sleepers, but the ballast is good (often being stone), and this is a great help in keeping the joints from sinking.

In England double-headed or bull-headed rails (not intended to be turned) are mostly used with cast-iron chairs, and deep fish-plates for suspended joints, which suit better with this than with the flange section. The fish-plates are only 16 to 18 in. long, and weigh 30 to 40 lbs., yet no rail-joints keep better than these; hardly a sunken joint can be detected, and no better or quicker traveling than on the English railways is anywhere to be found. The rails are 80 lbs. per yard or more, and in this great weight lies the secret, which will be referred to under the head of wear of rails.

THE MAKE OF FISH-PLATES.

The make of the fish-plates, whether of steel or of iron, is left to the option of the manufacturer. Generally they are punched hot, straightened in a press, and the ends filed or cleaned by an emery-wheel from burrs left from the saw. Sometimes, they are cut with shears. For inspection of the angle fish-plates the author has adopted a block of the same section as the rail, with four dubbs, or projecting pieces, placed as the fish-bolts in the joint. When the fish-plates are fitted into the block for ascertaining the accuracy of the section and bolt-holes, two clapps fixed to the block are turned up with two dubbs, which enter the holes or slots for the spikes to prove that the spike-holes are in their proper place in relation to the bolt-holes. This is a great improvement, and it only costs the time of an ordinary laborer to put on every fish-plate, and thus secure a perfect fit in the rail-joint.

Of course, the square bolt-hole weakens the fish-plate more than the round one; nevertheless, in the absence of failure, the author has of late adopted square bolt-holes in both, and the spike-hole 1 in. from the one end and 2 in. from the other. By this mode both fish-plates are alike, so that makers require only one block for punching bolt and spike-holes, and at the same time engineers do not require to keep their fish-plates in pairs as hitherto, only one kind being needed; still the spike-hole will come 2 in. out of the centre line, so as not to split the sleeper. If the fish-plates are made of steel and punched cold, thay must be annealed afterwards in order to regain the strength lost in punching. The acoompanying drawing of a complete joint for a light line is of the most modern type, and the same kind is used for heavy lines, but then it is somewhat larger, say, 24 to 28 in. in length. Such is the mode of making and using the angle fish-plates in Europe, and nowhere has the author ever heard complaints of their breaking. The accompanying drawings (for which I am indebted to the courtesy of Mr. John Fritz, of the Bethlehem Steel Works, Pa.) show the form of angle fish-plates on some of the best lines in America. From these figures it may be seen that they are a great deal stronger than those introduced in Sweden, or at any rate there is more metal in them. The difference between the American and the Swedish angle fish-plates is also that the former have slots while the latter have holes for the spikes. But this is no reason why they should break by thousands on American roads, as stated in the *Railroad Gazette*, 1885, where numerous articles have appeared under the heading, "Why Do Fish-plates Break?"

During the last six months there have been many explanations of this most unfortunate phenomenon published in the *Railroad Gazette*, but these have been not altogether satisfactory. Indeed, fish-plates are said not to be the right thing for obtaining a perfect line, and bridge-plates, or the so-called Fisher rail-joints, are strongly advocated.

In the year 1873, when rails broke through the bolt-holes at the time of punching, and the rails were made much harder than they now are, the author looked upon the Fisher joint as hopeful; but after drilling the bolt-holes had put an end to this kind of fracture the Fisher joint seemed to remain unnoticed, until recently revived in America. Indeed, during the author's long experience he has only had to inspect one order for rails for the Fisher joints; this was about 15,000 tons for Savannah, in 1882. It need not be said that the rail-ends for this joint must be quite square, the section most correct, and the corner notches for the bolt through the rail-flange very exact.

RAIL-JOINTS GENERALLY.

To obtain a line of equal strength and stiffness throughout is no easy task, in consequence of the expansion and contraction produced by the difference between summer and winter temperature.

To have a joint that can open, say, ⅛ in., and shut completely as the temperature changes, and yet be of equal stiffness with the solid rail, is certainly not a simple matter. Even if these conditions were fulfilled, the flattening of the extreme ends of the rail-head is almost unavoidable, at least for a weak rail of soft metal. To prove this, a cut say ¼ in. deep, and ¼ in. to ⅜ in. wide, was made in the head, in the middle of some steel rails, and they were laid down on the Swedish state line. It was found, after a few years' wear, that there were edges flattened on the rail-head just as at the joints. Hence it is the want of support of the molecule just at the end of the rail head which causes the metal to flow or spread (a kind of "flow of solids," as ably described by Tresca), and this all the more as the rail steel is soft. In order to avoid flattened rail-ends, the corners are sometimes filed off, but there is wanted a hard metal and a big rail-head, of which the end is not crushed or squeezed out of form. Anyhow with steel rails it is not so bad as with iron rails, where the imperfect welding caused the ends to be crushed and spread out as a broom. The angle fish-plates having been extensively introduced into Sweden and Denmark and several other countries, the news of their breaking largely on American railroads will naturally cause much anxiety on this side of the Atlantic; and should the same sad experience show itself in course of time here, the author would be the first to look to the Fisher joint or to any other plan to obtain greater safety. He has no particular interest in any joint, yet so far as experience goes, the angular fish-plate has been found much better than the plain fish-plate. In countries with a hard climate the deep fish-plate was found to be objectionable, but it has the advantage in mild climates and particularly in England for double-headed or bull-headed rail sections.

(TO BE CONTINUED.)

The Western Railroad Club.

A meeting of this club was held at Chicago Jan. 28. An adjourned discussion on the subject of "Spark Arresters" took place.

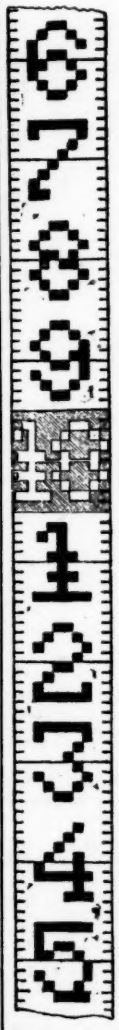
Mr. COOPER (Lake Erie & Western): I am using a spark arrester which gives good results with ordinary Illinois coal, and 2⅛ in. and 3 in. high double nozzles. A straight open stack 16 in. dia. is used with 16 in. and 17 in. cylinders. The netting is placed horizontally just below the nozzles. A diaphragm is bolted to an angle iron that swings out on a curve from just above the top tube to 6 in. in front, then runs downward diagonally, to 12 in. in front of the flue sheet and to the same distance from the bottom of the smoke box. The lower portion of the diaphragm is bolted to the upper by bolts running in slots and can be adjusted to any desired height. In the front lower corner there is an incline of brick that serves to keep the cinders from banking too tightly in that place.

A discussion then took place on "The Best Material for Car Sills."

Mr. SNOW (Illinois Central): Southern yellow pine or Norway is the most suitable, the latter giving greatest resistance to transverse strains, and being more flexible can better resist shocks in derailment. Oak is best for end sills. There is little difference in repairs, but Southern pine is the cheapest in first cost. The best sills in my experience were made of hickory. Spruce was generally used 40 years ago, and was easily worked. Mississippi timber, like Norway, will decay if sap is left on the corners.

Mr. VERBRYCK (Chicago, Rock Island & Pacific): Good Southern pine obtained before it is tapped will outlast Norway. The latter, however, is preferable for the reasons stated by Mr. Snow. Spruce sills from Maine were used on the Erie twenty two years ago, and proved very durable.

Graduation for Level and Stadia Rods.



The engraving at the side gives what will be recognized as admirable designs for numerals for marking self-reading level rods, which are at once distinct and easily read to tenths on long, rough sights, and so deftly spaced off that readings to hundreds and even to thousandths, if desired, may be readily taken at distances where, with ordinary marking, this would be quite impossible. An increasing number of engineers look on a target rod of any form as an abomination for practical railroad work, and with a well-designed reading rod it may be questioned whether there is any real gain in accuracy, while there is certainly a considerable loss in time and convenience. On the occasional long sights where it is impossible to read the figures, the edge of a black straight-edge or of an envelope affords a very good substitute for a target, without the annoyance of having it to look after when not wanted. Self-reading rods, moreover, may easily be two or three feet longer than the target type, since a light pine rod answers every purpose and is rarely broken. The graduation is best done on paper slips pasted or glued to the rod and well varnished, although stenciling is sometimes preferred. The foot marks are in white on a red ground, making them readily distinguishable.

This graduation is especially suitable for stadia work, which is deserving of more use in preliminary railroad fieldwork than it has. For leveling, those who are in the habit of carrying out level notes to thousandths will doubtless prefer a target-rod, but as such refinements are entirely unjustified by the possible accuracy of reading without using an umbrella over the instrument, level bubbles on the rod, and avoiding work in all bad weather, it is well that the number of such is decreasing. The theory of probabilities agrees with common sense in indicating that without these precautions there is little if any real decrease of the "probable error," but there is a delusive appearance of accuracy about it which seems to have a certain fascination for many.

The graduation illustrated was designed by Mr. Benjamin S. Lyman, of Northampton, Mass., who communicates it to the *Engineering and Mining Journal*. It has been in practical use since 1868, with some improvements. By holding it at a considerable distance its excellence will be clearly perceived. It is the best we have seen.

TECHNICAL.

Locomotive Building.

The Baldwin Locomotive Works in Philadelphia have a number of orders on hand, and expect to increase their output considerably this year over that of last year.

The Rogers Locomotive Works in Paterson, N. J., have several orders for locomotives on hand, and have recently placed orders for a number of engine trucks and tender wheels.

H. K. Porter & Co. in Pittsburgh are at present very busy, having orders for a number of locomotives. Recent shipments include shifting engines for the Homestead Steel Mill near Pittsburgh, and for the Guadalupe Silver Mining Co. in Mexico; 6 engines to be used in construction on the Panama Canal, and a light passenger engine, or motor, for the Seneca Falls & Waterloo Railroad in New York. One of the orders recently received was from Japan.

The Cooke Locomotive Works in Paterson, N. J., have received an order for 20 heavy ten wheel freight locomotives. It is not stated for what road they are intended.

The Car Shops.

The Wason Manufacturing Co. at Brightwood (Springfield), Mass., has recently taken orders for 1 passenger car for the Knox & Lincoln road, 3 for the Connecticut River, 4 for the Boston & Providence, 7 for the Boston & Maine, 7 for the Old Colony, 8 for the Maine Central, and 16 for the Annapolis & Baltimore Short Line, making a total of 46 new passenger cars.

The Indianapolis Car Works in Indianapolis are building 100 freight cars for the Ohio Valley road.

The Ensign Manufacturing Co. in Huntington, W. Va., has recently taken orders for 12 flat cars and 1 caboose for the Chesapeake & Nashville road, 26 patent stock cars for a stock line, 90 box cars for the Chesapeake, Ohio & Southwestern and 500 box cars for another road.

The Rote Automatic Brake Co. in Mansfield, O., has recently received orders to equip a number of freight cars for the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific and the Lehigh Valley roads. The company is also putting its brake on 100 refrigerator cars running between Chicago & New York.

The Anniston Car Works in Anniston, Ala., were sold by the assignee, Jan. 30, and were bought for $9,133, subject to certain liens, by W. S. Tuttle, President of the Knoxville Iron Co. It is understood that the works will be started up again as soon as possible.

Car Couplers.

The Chicago, Burlington & Quincy shops in Aurora, Ill., are fitting up ten coal cars with the Perry coupler, which was one of the 12 couplers selected by the Master Car-Builders' Committee at the Buffalo tests, and was assigned to this road for an extended trial.

Bridge Notes.

The Keystone Bridge Co. in Pittsburgh has received the contract for the extension of the Brooklyn Bridge across Chatham and Centre streets in New York. The work is to be completed in 90 days. The structure will be somewhat similar to those of the elevated railroads in New York, with room for three tracks and passenger platforms.

The Berlin Iron Bridge Co. in East Berlin, Ct., has resolved to establish branch works in Binghamton, N. Y., and also to increase its capital stock from $100,000 to $200,000.

Iron and Steel.

The New Albany Steam Forge Co., in New Albany, Ind., is preparing to start up its works shortly.

The rolling mill of Arms, Bell & Co., at Youngstown, O., was destroyed by fire on the morning of Jan. 26. The loss is estimated at $78,000, the insurance being $42,000. The mill was burned in 1882 and was then rebuilt in a very complete manner. Its product was railroad spikes, bolts and nuts, the iron for this purpose being rolled in the mill.

The American Tube & Iron Co. is adding several new furnaces and other machinery to its works at Middletown, Pa., with the intention of increasing their capacity to 200 tons per day.

The New Albany Rolling Mill, in New Albany, Ind., is being enlarged by the addition of a new mill for the manufacture of merchant bar.

Messrs. Long & Co., of Pittsburgh, owners of the Vulcan Forge & Iron Works at Chartiers, Pa., give notice that Mr. C. S. McGill has sold his interest in the business, and that Mr. J. Morgan Coleman has become a partner in the firm.

Manufacturing and Business.

The Niles Tool Works in Hamilton, O., have sold to the Minnesota & Northwestern Co. a complete outfit of machine tools for the repair shops in St. Paul, including planers, lathes, axle and driving wheel lathes, car wheel borer, wheel press and other tools. The sale was made through the Chicago branch office.

The Rail Market.

Steel Rails.—A considerable demand for small lots is reported, and a number of orders for 5,000 tons or less have been placed. Several large orders are still reported on the market, and quotations are steady at $34.50@$35 per ton at mill.

Rail Fastenings.—The market is firm with increasing demand reported, and quotations are steady at 2.25 cents per lb. for spikes at Pittsburgh; 2.75@3 cents for track-bolts and 1.70@1.75 for splice-bars.

Old Rails.—Old iron rails are quoted at $21.50@$22.50 per ton at tidewater, with a number of sales. Old steel rails are scarce and in demand at $22.50@$24 per ton in Pittsburgh.

Engineers' Club of St. Louis.

A regular meeting of this Club was held in St. Louis, Jan. 20, President McMath in the chair and 9 members present. Mr. James M. Chaphe was elected a member.

The committee reported the adoption of a rule to the effect that all papers read before the club and intended for publication should be forwarded to the Secretary, for consideration by the Executive Committee.

The thanks of the club were voted to Mr. William E. Worthen for the gift of a handsome copy of the "Cyclopedia of Drawing."

Mr. P. M. Bruner read a paper on the Use of Hydraulic Cement, which was discussed, and the club then adjourned.

At a regular meeting in St. Louis, Feb. 3, Messrs. Abraham Cook and Julius Baier were elected members.

Mr. M. L. Holman presented some interesting experiments on the commercial brick for engineering purposes.

Prof. C. M. Woodward read a paper on "The Theory of Ammonia Refrigerators." The paper was generally discussed, and Professor Woodward was requested to prepare his paper for publication.

Engineers' Club of Philadelphia.

At the regular meeting in Philadelphia, Jan. 16, President Washington Jones occupied the chair, with 24 members present.

Mr. Howard Constable gave an interesting account of the system in use in London for the public supply of hydraulic power, which was started in 1882 and was the outgrowth of the existing employment of hydraulic cranes, capstans and similar machinery in warehouses, docks and railroad stations.

Mr. Constable also described a novel rubber spring for street cars, railroad draw-bars, buffers and the like. It consists of a cylindrical piece of rubber with a hole through the axis, and capped at both ends with bearing-plates; the draw-bar, or location-bolt, of course, passes through the bearing-plates and rubber spring. The peculiar feature is that a steel spring encircles the rubber, so that as the rubber is compressed it is reinforced by an increasing resistance on the part of the steel spring, which tends to hug it back to its original form. It presents some excellent features for long range, endurance, uniformity of gradation of resistance, freedom from danger in collapse as well as in economy. They are being extensively used in England, and one that has been under test by the Chief Engineer of the Northeastern Railway has withstood up to the present time over 1,000,000 depressions of 5 tons. A model was shown, and it should be noted that the steel ring is not solid, but laps orer itself, so that the ends slide over each other as the rubber presses the spring outward. Also that the section of the spring can be U, W or other shape.

Prof. L. M. Haupt read a profusely illustrated paper on harbors, containing data as to depth, etc., and showing that from New York to the Gulf of Mexico there were only 4 natural entrances where the depth at mean low water was over 16 ft. He also exhibited a model of a portion of the bed of the lower bay of New York, illustrating proposed improvements in the channel.

Messrs. Coleman Sellers, Jr., Wilfred Lewis and M. R.

Mucklé, Jr., were appointed a committee to prepare a memorial of the late Theodore Bergner.

Carbonic Acid Gas Liquefied and Solidified.

At a recent meeting of the German "Verein zur Beforderung des Gewerbfleisses," a speaker stated that the manufacture of liquefied carbon dioxide had become quite an extensive business. Krupp, at Essen, employs liquid carbon dioxide as a means of exercising great pressure on steel castings during solidification. It is also successfully used to remove the outer rings from condemned ordnance. The entire gun is heated, and the inner tube is then rapidly cooled by means of liquid carbon dioxide. Improvements in the method of manufacturing the liquid dioxide were worked out at Essen and its systematic supply on a commercial scale has been developed by Kuhaheim & Co., of Berlin. At present the company are delivering 80 bottles per day of liquid dioxide, each bottle containing 18 lbs. and costing $4. This daily manufacture is equivalent to 100,000 gallons of gas. The bottles are of wrought iron and are tested to 250 atmospheres pressure. Solid carbon dioxide is made by allowing liquid dioxide in a container to become gaseous and rush out through an outlet, over which a porous bag is secured. A large portion of the gas escapes as such through the sides of the bag, but so much heat is absorbed that another portion solidifies and is caught in the bag like snow. This can be made, by pressure, into a substance like chalk.

Electric Headlights for Locomotives.

Electric headlights—that is to say, electric lamps placed in front of locomotives to light up the permanent way—have been tried on several lines; but we have not heard, hitherto, how far they have been successful. Recent experience, however, in Russia appears to show that financial considerations are not alone unfavorable to the system. On the railway between St. Petersburg and Moscow several locomotives were fitted with electric lamps. For a time they gave great satisfaction, lighting the way three-quarters of a mile in front. But the employés began to complain of the contrast between the lighted and the unlighted surfaces painfully affecting the eyes; and doctors ere long reported that there had been several cases of grave injury to the eyes in this way. Hence the lamps were abandoned. The directors have not, however, given up the idea of better illumination of the line, and they now contemplate placing electric lamps so as to illuminate about 3,300 ft. on either side of the station.—*Iron.*

Ries' Automatic Alarm Signals.

Some experiments are being made near Baltimore with a track apparatus which causes the whistles of an approaching locomotive to sound when approaching crossings, way stations or curves. Mr. Elias E. Ries, of Baltimore, the inventor, has patented further devices by which a train can be stopped by track treadles, etc., should the engineer disregard ordinary danger signals.

The Leslie Rotary Steam Snow Shovel.

The following letter gives particulars of the work done during January by this new form of snow plow, which was built by the Cooke Locomotive Works of Paterson, N. J. An illustration showing the plow at work was given in the *Railroad Gazette* of April 24, 1885. The first plow of the kind built was illustrated in an earlier issue of the *Gazette*, but the design has since been considerably improved in detail, and the various parts have been materially strengthened:

The plow was put at work on Jan. 12, on the Chicago & Northwestern Railroad, and cleaned off the track in good style. There were a number of snow falls between the 18th and 26th and the plow was in great demand all along the line. The snow that fell was very hard and compact, so that the work done by the plow was of the most difficult nature. The following letter in relation to the matter was received from Mr. M Hopkins, Superintendent of the Northern Iowa Division of the Chicago & Northwestern Railroad, and it was accompanied by the subjoined table showing how many banks of snow the plow removed and the time it occupied in doing so, the record being kept by a book-keeper sent with the plow by Mr. Hopkins for that purpose. Mr. Hopkins writes to Mr. J. S. Leslie, of Paterson, N. J.:

"Your plow did most excellent service, and with some improvements I have no doubt it will do still better work. People east of Chicago could not believe that such snow is to be found anywhere in this country—snow that could be cut out in blocks with shovels, and thrown out of cuts, leaving them as square as stone taken from a quarry; snow so hard that when you walked over it, it would not show the imprint of your feet. This snow was drifted into cuts with the mercury 20 degrees below zero, with a blizzard blowing 30 miles an hour. You labored under a disadvantage in having men with you who knew nothing about the plow."

Length of cut (feet).	Depth of snow on the rail in feet.	
1,350	5	21 minutes.
720	4	9 "
720	4 to 6	13 "
1,440	9½	112 "
1,320	3 to 4	13 "
1,320	3 to 4	10 "
1,080	4 to 5	8 "
1,320	3 to 4	16 "
1,080	7 to 10	31 "
1,080	4 to 6	11 "
1,880	3 to 5	8 "
1,800	5 to 8	16 "

The figures given above are only a few of those contained in Mr. Hopkins' letter, but give a fair specimen of the performance of the snow plow.

THE SCRAP HEAP.

Train Accident Report—Correction.

In our record of train accidents in December, on page 69, in No. 29, appeared the following:

"4th, a. m., locomotive of passenger train on Georgia Railroad exploded its boiler when near Barnesville, Ga., killing the engineer and injuring the fireman."

We are informed by the Superintendent of the Georgia Railroad that there was no explosion of a boiler on that road during the month, and investigation shows that we were mistaken. The explosion did not occur on the Georgia Railroad, but on the Upson County road, a short line in Georgia.

A Runaway Train Accident.

A St. Louis dispatch of Feb. 8 says: "A train of 62 loaded freight cars, drawn by one engine and pushed by another, were going down grade on the Poplar street track early this morning, when the coupling broke, and a collision between the two sections resulted, throwing 7 cars from the track and running into the houses on each side of the street and tearing up things generally.

"The responsibility for the accident is not clear, but seems to be divided. The train was moving at the rate of 7 miles an hour, when the coupling of one of the middle cars parted. This was at Fifth street. The forward section of the bisected train, drawn by engine 305, ran ahead, leaving a gap between the cars. When the forward train reached the levee and switched south, Engineer Mahoney found his way blocked by another engine, and began to slack up. In the meantime

RAILROAD EARNINGS IN DECEMBER.

Name of Road.	Mileage. 1885.	1884.	Inc.	Dec.	P. c.	Earnings. 1885.	1884.	Inc.	Dec.	P. c.	Earnings per Mile. 1885.	1884.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Baltimore & Potomac	92	92	....	....	....	$ 107,845	$ 100,137	$ 7,708	$	7.7	$ 1,172	$ 1,088	$ 84	$	7.7
Boston, Hoosac Tun. & West.	87	87	....	....	....	46,952	35,032	11,920	.....	34.0	540	402	138	.....	34.0
Buffalo, N. Y. & Phila.	663	663	....	....	....	204,516	179,291	25,225	.....	14.1	308	270	38	.....	14.1
Buffalo, Rochester & Pitts.	294	294	....	....	....	113,539	92,952	20,587	.....	22.	386	316	70	.....	22.1
Danbury & Norwalk	37	37	....	....	....	16,725	14,431	2,294	.....	15.9	452	390	62	....	15.9
Grand Trunk	2,977	2,977	....	....	....	1,554,090	1,605,349	.....	51,250	3.2	522	539	...	17	3.2
Long Island	354	354	....	....	....	179,603	171,410	8,193	.....	4.7	507	484	23	....	4.7
N. Y. City & Northern	54	54	....	....	....	38,107	24,037	14,070	.....	58.6	706	445	261	.....	58.6
N. Y., L. Erie & West.	1,075	1,075	....	....	....	1,505,885	1,262,720	243,165	.....	19.2	1,401	1,175	226	.....	19.2
N. Y. & New England	400	400	....	....	....	311,016	239,049	71,967	.....	30.1	778	598	180	....	30.1
N. Y., Ontario & Western	373	373	....	....	....	139,684	144,738	.....	5,054	3.5	374	388	...	14	3.5
N. Y., Sus. & Western	147	147	....	....	....	86,405	87,686	.....	1,281	1.5	588	597	...	9	1.5
Northern Central	322	322	....	....	....	507,699	442,269	65,430	.....	14.8	1,577	1,374	203	....	14.8
Pennsylvania	2,310	2,268	42	....	1.8	4,046,681	3,769,327	277,354	.....	7.4	1,752	1,663	89	.....	5.4
Philadelphia & Reading	1,560	1,560	....	....	....	2,592,529	2,315,563	276,966	.....	11.9	1,66	1,484	178	....	11.9
Rome, Watertown & Ogd'g.	418	418	....	....	....	156,092	138,590	17,502	.....	12.6	373	332	41	....	12.6
West Jersey	200	200	....	....	....	86,864	83,131	3,733	.....	4.5	434	416	18	.....	4.5
Total, 17 roads	11,363	11,321	42	.....	....	11,694,241	10,705,712	1,046,114	57,585	....	1,029	945	84	.....	....
Total inc. or dec	.....	.....	42	.....	0.4	.....	.....	988,529	.....	9.2	.....	.....	84	.....	8.7
SOUTHERN ROADS.															
Alabama Great Southern	290	290	....	....	....	115,885	149,079	.....	33,194	22.1	400	514	..	114	22.1
Chesapeake & Ohio.	520	520	....	....	....	275,000	308,912	.....	33,912	11.0	529	595	...	66	11.0
Ches., Ohio & Southwestern.	399	399	....	....	....	144,196	138,278	5,918	.....	4.3	361	347	14	....	4.3
Cin., N. O. & Tex. Pacific.	336	336	....	....	....	262,059	239,030	22,999	.....	9.3	780	711	69	....	9.3
East. Tenn., Va. & Ga	1,100	1,100	....	....	....	408,554	376,803	31,751	.....	8.4	371	343	28	....	8.4
Florida Ry. & Nav. Co.	540	510	30	....	5.9	111,199	104,981	6,218	.....	5.9	206	206	....	....	....
Ill. Cen., Southern Div.	711	711	....	....	....	550,001	562,686	.....	12,685	2.3	774	792	...	18	2.3
Kentucky Central	250	250	....	....	....	55,000	66,730	.....	11,730	17.5	220	267	...	47	17.5
Louisville & Nash.	2,015	2,065	....	50	2.4	1,163,318	1,292,127	.....	128,809	10.0	577	626	....	49	7.8
Memphis & Charleston	292	292	....	....	....	158,933	174,633	.....	15,700	9.0	544	598	....	54	9.0
Mobile & Ohio	527	527	....	....	....	282,577	284,637	.....	2,060	0.7	536	540	...	4	0.7
Nashville, Chatta. & St. L.	580	574	6	....	1.0	193,327	197,512	.....	4,185	2.1	333	344	....	11	3.2
N. Orleans & Northeastern.	195	195	..	....	....	82,821	97,765	.....	14,944	15.5	425	501	....	76	15.5
Norfolk & Western	512	512	..	....	....	249,432	247,103	2,329	.....	0.9	487	483	4	....	0.9
Rich. & Danville	757	757	....	....	....	344,900	366,700	.....	21,800	5.9	456	484	...	28	5.9
Char., Col. & Augusta	370	370	....	....	....	75,810	82,763	.....	6,953	8.4	205	224	...	19	8.4
Col. & Greenville	296	296	....	....	....	76,275	82,069	.....	5,794	7.0	258	277	....	19	7.0
Georgia Pacific	318	313	5	....	1.6	79,000	71,800	7,200	.....	10.0	248	229	19	....	8.3
Virginia Midland	352	352	....	....	....	124,159	115,613	8,546	.....	7.4	353	328	25	....	7.4
Western N. Carolina	274	274	....	....	....	39,573	36,954	2,619	.....	7.1	144	135	9	....	7.1
South Carolina	247	247	....	....	....	122,510	131,195	.....	8,685	6.6	496	531	...	35	6.6
Vicksburg & Meridian	142	142	....	....	....	74,024	62,882	11,142	.....	17.7	521	443	78	....	17.7
Total, 22 roads	11,023	11,032	41	50	....	4,988,523	5,190,252	98,722	300,451	....	453	470	...	17	....
Total inc. or dec	.....	.....	...	9	0.1	.....	.....	.....	201,729	3.9	.....	.....	...	17	3.6
CENTRAL GROUP.															
Chi. & Eastern Illinois	252	252	....	.....	...	160,834	132,985	27,849	.....	20.8	638	528	110	....	20.8
Chi. & West Michigan	413	413	....	....	....	99,650	92,639	7,011	.....	7.5	241	224	17	....	7.5
Cin., Ind., St. L. & Chicago	342	342	....	....	....	205,706	203,093	2,613	.....	1.2	601	593	8	....	1.2
Cin., Wash. & Baltimore	281	281	....	....	....	162,995	164,686	.....	1,691	1.0	580	586	...	6	1.0
Cleve., Akron & Columbus	144	144	....	....	....	37,790	34,239	3,551	.....	10.4	262	238	24	....	10.4
Cleve., Col., Cin. & Ind	391	391	....	....	....	314,536	277,675	36,861	.....	13 3	804	710	94	....	13.3
Detroit, Lansing & No.	261	261	....	....	....	90,655	83,141	7,514	.....	9.0	347	319	28	....	9.0
Evansville & Terre Haute	146	146	....	....	....	60,582	55,381	5,201	.....	9.5	415	379	36	....	9.5
Flint & Pere Marquette	362	362	....	....	....	177,033	171,844	5,189	.....	3.0	489	475	14	....	3.0
Illinois Central, Ill. lines	953	953	....	....	....	564,499	496,819	67,680	.....	13.6	592	521	71	....	13.6
Ind., Bloom. & West.	532	532	....	....	....	234,259	167,943	66,316	.....	39.5	440	316	124	....	39.5
N. Y., Pa. & Ohio.	587	587	....	....	....	539,709	452,449	87,260	.....	19.3	919	771	148	....	19.3
Ohio & Mississippi	615	615	....	....	....	312,904	283,076	29,828	.....	10.5	509	460	49	....	10.5
Ohio Southern	130	130	....	....	....	53,084	47,110	5,974	.....	12.7	408	362	46	....	12.7
Peoria, Decatur & Ev.	254	254	....	....	....	61,294	57,055	4,239	.....	7.4	241	225	16	....	7.4
St. L., Alton & Terre Haute:															
Main Line	195	195	....	....	....	107,763	95,168	12,595	.....	13.2	553	488	65	....	13.2
Belleville Line	138	138	....	....	....	70,156	61,453	8,703	.....	14.2	508	445	63	....	14.2
St. Louis & Cairo	161	161	....	....	....	26,299	20,930	5,369	.....	25.6	163	130	33	...	25.6
Wabash, St. L. & Pacific	2,373	2,373	....	....	....	1,133,054	1,176,928	.....	43,874	3.7	477	496	....	19	3.7
Total, 19 roads	8,530	8,530	....	....	....	4,412,802	4,074,614	383,753	45,565	....	517	478	39	.....	....
Total inc. or dec	.....	.....	....	....	....	.....	.....	338,188	.....	8.3	.....	.....	39	....	8.3
NORTHWESTERN ROADS.															
Bur., Cedar Rap. & No.	990	888	102	.....	11.5	266,909	288,451	.....	21,542	7.5	270	325	...	55	16.9
Central Iowa	500	500	..	....	....	126,871	116,249	10,622	.....	9.1	254	232	22	....	9.1
Chi. & Alton	850	850	....	....	....	700,546	692,711	7,835	.....	1.2	824	815	9	....	1.2
Chi., Mil. & St. Paul	4,953	4,804	149	.....	3.1	2,335,000	2,218,998	116,002	.....	5.2	471	462	9	....	1.9
Chi. & Northwestern	3,843	3,843	..	....	....	1,979,100	1,951,746	27,354	.....	1.4	515	508	7	....	1.4
Chi., St. P., Minn. & Omaha	1,335	1,300	35	.....	2.9	467,000	441,190	25,810	.....	5.8	350	340	10	....	2.9
Des Moines & Ft. Dodge	138	138	....	....	....	35,000	29,435	5,565	.....	18.9	274	233	41	....	18.9
Ill. Central, Iowa lines	402	402	....	....	....	151,100	150,541	559	.....	0.4	376	374	2	....	0.4
Marquette, H. & Ont.	160	138	22	....	15 7	28,659	21,425	7,234	.....	33.8	179	155	24	....	15.5
Mil., Lake Shore & West.	527	400	127	.....	31.8	107,490	87,588	19,902	.....	22.7	204	219	....	15	6.8
Mil. & Northern	227	227	....	....	....	44,989	42,693	2,296	.....	5.3	198	188	10	....	5.3
Wisconsin Central.	440	440	....	....	....	121,504	129,571	.....	8,067	6.2	276	294	...	18	6.2
Total, 12 roads	14,365	13,930	435	.....	....	6,364,168	6,170,598	223,179	29,609	....	443	443	....	....	....
Total inc. or dec	.....	.....	435	.....	3.1	.....	.....	193,570	.....	3.1	.....	.....	....	....	....
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	3,527	3,064	463	.....	14.9	713,600	521,552	191,448	.....	36.7	202	170	32	....	18.8
Northern Pacific	2,691	2,453	238	.....	9.8	775,371	758,229	17,142	.....	2.3	288	309	...	21	7.0
St. P. & Duluth	227	227	....	....	....	126,287	109,859	16,428	.....	14.9	556	484	72	...	14 9
St. P., Minn. & Manitoba	1,485	1,471	14	.....	0.9	685,744	819,439	.....	133,695	16.3	462	557	.....	95	17.1
Total, 4 roads	7,930	7,215	715	.....	....	2,300,402	2,209,079	225,018	133,695	....	290	306	.....	16	....
Total inc. or dec	.....	.....	715	.....	10.0	.....	.....	91,323	.....	4.1	.....	.....	.....	16	5.2
SOUTHWESTERN ROADS.															
Fort Worth & Denver	144	110	34	.....	30.9	33,078	25,684	7,294	.....	28.4	230	233	...	3	1.3
Gulf, Colorado & Santa Fe	590	536	54	.....	10.1	205,880	142,048	63,832	.....	45.0	349	265	84	....	31.7
Kan. City, Ft. Scott & Gulf	389	389	....	....	....	185,435	220,763	.....	35,328	16.0	477	567	...	90	16.0
Kan City, Sp'f'd & Memp.	282	282	....	....	....	127,954	140,286	.....	12,332	8.8	454	497	...	43	8.8
St. L., Ft. Scott & Wichita	215	182	33	...	18.1	56,409	40,328	16,081	.....	40.1	262	222	40	....	18.0
St. L. & San Francisco	804	804	...	.....	....	376,864	352,617	24,247	.....	6.9	469	439	30	...	6.9
Texas & St. Louis	735	735	....	....	....	158,355	125,252	33,103	.....	26.5	215	170	45	...	26.5
Vicks., Shreveport & Pac.	170	170	....	....	....	70,926	55,560	15,366	.....	27.4	417	327	90	...	27.4
Total, 8 roads	3,329	3,208	121	.....	....	1,214,901	1,102,538	160,023	47,660	....	365	344	21	....	....
Total inc. or dec	.....	.....	121	.....	3.8	.....	.....	112,363	.....	10.2	.....	.....	21	....	6.1
FAR WESTERN AND PACIFIC ROADS.															
Denver & Rio Grande	1,317	1,317	....	.....	....	496,487	421,359	75,128	.....	17.9	377	320	57	.....	17.9
Denver & R. G. Western	368	368	....	.....	....	74,238	98,830	.....	24,592	24.6	202	269	67	....	24.6
St. Joseph & Grand Island	232	232	....	.....	....	104,347	90,650	13,697	.....	15.0	414	360	54	....	15.0
Union Pacific	4,519	4,476	43	.....	0.9	2,348,486	2,319,585	28,901	.....	1.2	515	518	...	3	0.5
Total, 4 roads	6,456	6,413	43	.....	....	3,023,558	2,930,424	117,726	24,592	....	468	457	11	....	....
Total inc. or dec	.....	.....	43	.....	0.7	.....	.....	93,134	.....	3.2	.....	.....	11	....	2.4
GRAND TOTAL:															
Total, 86 roads	62,996	61,649	1,397	50	....	33,998,595	32,383,217	2,254,535	639,157	.....	540	525	15	.....	....
Total inc. or dec	.....	.....	1,347	.....	2.2	.....	.....	1,615,378	.....	5.0	.....	.....	15	.....	2.8

RAILROAD EARNINGS, YEAR ENDING DECEMBER 31.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1885.	1884	Inc.	Dec.	P. c.	1885.	1884.	Inc.	Dec.	P. c.	1885.	1884.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Balt. & Potomac	92	92	....	....	....	$ 1,323,691	$ 1,224,572	$ 98,519	$	8.0	$ 14,381	$ 13,311	$ 1,070	$	8.0
Boston & Albany	384	384	...	....	....	7,758,872	8,021,821	.....	262,949	3.3	20,205	20,800	...	685	3.3
Bos., Hoos. T. & W.	87	87	...	....	....	481,985	452,174	29,811	.....	6.6	5,540	5,197	343	....	6.6
Buff.,Roch. & Pitts.	294	294	....	....	....	1,226,685	1,142,749	83,936	.....	7.3	4.172	3,887	285	....	7.3
Dan. & Norwalk.	37	37	....	....	....	224,912	211,131	13,781	.....	6.5	6.079	5.706	373	....	6.5
Grand Trunk	2,958	2,958	....	....	....	15,432,707	17,281,724	.....	1,849,017	10.7	5,217	5,842	....	625	10.7
Hunt. & B. T. Mt.	64	64	....	....	....	371,001	333,560	37,441	.....	11.2	5,797	5,212	585	....	11.2
Long Island	354	354	....	....	....	2,854,090	2,772.034	82,056	.....	3.0	8,062	7,831	231	....	3.0
N. Y. C. & H. R.	954	954	..	....	....	24,465,272	27,044,710	.....	2,579,438	9.5	25,645	28,356	...	2,711	9.5
N. Y., L. E. & West	1,075	1.075	....	....	..	16,045,373	16,541,810	.....	496,437	3.0	15,654	16.138	...	484	3.0
N. Y. & New Eng.	400	400	..	....	....	3,116,033	2,945,917	170,114	.....	5.8	7,790	7.365	425	....	5.8
N. Y., Ontario & W.	373	373	....	....	....	1,957.343	1,964,316	.....	6,973	0.4	5.248	5,266	....	18	0.4
N. Y., Susq. & W.	147	147	....	....	....	1,092,354	1,034,210	58,144	.....	5.6	7.431	7.035	396	....	5.6
Northern Central	322	322	....	....	....	5,490.922	5,521.877	.....	30,955	0.6	17,053	17.149	....	96	0.6
Pennsylvania	2,284	2,146	138	....	6.5	45,615,034	48,566,918	.....	2,951,884	6.1	19,971	22,631	....	2,660	11.8
Phila. & Reading	1,560	1,560	....	....	....	29,230,543	30,972,160	.....	1,741,6 7	5.6	18,737	19,854	....	1,117	5.6
Pitts., McK. & Y.	74	74	....	....	....	587,723	591.501	.....	3,778	0.6	7,942	7,993	....	51	0.6
Rome, Wat. & Ogd.	411	418	....	....	....	1,739,736	1,714,860	24,876	.....	1.4	4.162	4,103	59	....	1.4
West Jersey	200	191	9	....	4.7	1,286,011	1,319,648	.....	33,637	2.5	6.430	6,909	...	479	7.0
Total, 19 roads	12,077	11,930	147	..	....	160,299,687	169,657,694	598,678	9,956,685	....	13,273	14,221	...	948	....
Total inc. or dec.	.....	.....	147	....	1.2	.....	.....	.....	9,358,007	5.5	.....	.....	...	948	6.7
SOUTHERN ROADS.															
Ala. Gt. Southern	290	290	....	....	....	1,076,371	1,165,102	.....	88,731	7.6	3,712	4,018	....	306	7.6
Ches. & Ohio	520	520	....	....	....	3,322,040	3,538,605	.....	216,565	6 1	6.389	6,805	....	416	6.1
Ches., O. & S'west.	399	399	....	....	....	1,567,765	1,374,645	193,120	.....	14.1	3,929	3,445	484	....	14 1
Cin., N.O. & Tex. P.	336	336	....	....	....	2,681,859	2,658,185	23,674	.....	0.9	7,982	7,911	71	...	0.9
E. Tenn.,Va. & Ga.	1,100	1,100	..	....	....	4,119,147	3,993,622	125,525	.....	3.2	3,745	5,631	114	...	3.2
Fla. Ry. & Nav.Co.	535	493	42	....	8.6	991,894	983,251	8,643	.....	0.9	1,854	1,994	..	140	7.0
Ill. Cent., So. Div.	711	611	100	....	13.3	4,434,816	4,320,131	114,685	.....	2.8	6,237	7,071	....	831	11.7
Kentucky Cent	250	231	19	....	8.3	842,051	922,107	.....	80,056	8.7	3,368	3,992	....	624	15.6
Louisville & Nash.	2,029	2,065	....	36	1.7	13,671,335	13,662.465	8,870	.....	0.1	6,738	6.616	122	...	1.8
Mem. & Charleston	292	292	....	....	....	1,339,848	1,428,682	.....	88,834	6 2	4,589	4,893	....	3 4	6.2
Mobile & Ohio	527	527	....	....	....	2,057,381	2,160.412	.....	103,031	4.8	3,904	4,099	....	195	4.8
Nash.,Chat.& St. L.	576	562	14	....	2.5	2,134,527	2,358,682	.....	224,155	9.5	3,706	4,197	....	491	11.7
Natchez, J. & Col.	100	100	....	....	....	194.358	181,860	12,498	.....	6.9	1,944	1,819	125	....	6 9
N. O. & Nor'east.	195	195	....	....	....	698,287	597,446	100,841	.....	16.4	3,581	3,064	517	....	16.4
Norfolk & Western	512	504	8	....	1.6	2,771,121	2,711,153	59,968	.....	2.2	5,412	5,380	32	....	0.6
Rich. & Danville	757	757	....	....	....	3,960,258	3,873,715	86,543	.....	2.2	5,230	5.117	103	....	2.2
Char., Col. & Aug	370	364	6	....	1.7	810,437	775,104	35.333	.....	4.6	2,190	2,129	61	....	2.9
Col. & Greenville	296	296	....	....	....	697,232	686,993	10,239	.....	1.5	2,356	2,321	35	....	1.5
Georgia Pacific	318	306	12	....	3.9	679,344	600,182	79,162	.....	13.2	2,136	1,961	175	....	8.9
Va. Midland	352	352	....	....	....	1,544.174	1,590,097	.....	45,923	2.9	4,387	4.517	....	130	2.9
Western N. C	274	235	39	....	17.1	466,947	435,434	31,513	.....	7.2	1,704	1,853	....	149	8.1
South Carolina	247	247	....	....	....	1,151,841	1,233,292	.....	81,451	6.6	4,663	4,993	....	330	6.6
Vicks. & Meridian	142	142	..	....	....	486,151	507,267	.....	21,116	4.2	3,424	3,572	....	148	4.2
Total, 23 roads	11,128	10,924	240	36	....	51,699,184	51,758,432	890.614	949,862	....	4,646	4,738	....	92	....
Total inc. or dec.	.....	.....	204	...	1.9	.....	.....	..	59,248	0.1	.... ..	. . .	....	92	1.9
CENTRAL GROUP.															
Chi. & Eastern Ill.	252	252	....	....	....	1,661,834	1,546,115	115,719	.....	7.5	6,595	6,135	460	....	7.5
Chi. & West Mich.	413	413	....	....	....	1,297,301	1,469,667	.....	172,366	11.7	3,141	3 559	..	418	11.7
Cin.,Ind..St.L.&Chi	342	342	....	...	....	2,372.038	2,434,780	.....	62.742	2.6	6,936	7,125	...	189	2 6
Cin., Wash. & Balt.	281	281	....	....	....	1,707,146	1,824,647	.....	117,501	6.4	6,072	6.493	....	421	6.4
Cleve.,Akron & Col.	144	144	....	....	....	482,799	479,281	3,518	.....	0.7	3,353	3,328	25	....	0.7
Cleve., C., C. & I.	391	391	....	....	....	3,638 287	3,764,292	.....	126.005	3.4	9,305	9,627	....	322	3.4
Det., Lan. & No	261	261	....	....	....	1,228,471	1,328.591	.....	100,120	7.4	4,707	5.090	....	383	7.4
Ev. & Terre Haute.	146	146	....	....	....	749,873	743,641	6,232	.....	0 9	5.136	5.092	44	....	0.9
Flint & Pere Marq.	362	362	....	....	....	1,936,868	2,252,987	.....	316,119	14.0	5,350	6,224	...	874	14.0
Ill. Cen., Ill. lines.	953	953	....	....	....	6,508.112	6,158,312	349.800	.....	5.7	6 829	6,462	367	....	5.7
Ind., Bloom. & W.	532	532	....	....	....	2,412,678	2,302.923	110,655	.....	4.8	4,535	4,327	208	....	4.8
Lake Shore & M. S.	1,340	1,340	....	....	....	14,088,457	14.843.584	.....	755.127	5.2	10,514	11,077	....	563	5.2
Michigan Central	1,505	1,505	....	..	..	10,755.000	11,659.077	.....	904,077	7 8	7,146	7,747	....	601	7.8
N. Y., Pa. & Ohio	587	587	....	....	....	5,167,175	5,621,336	.....	454,161	8.1	8.803	9,576	....	773	8.1
Ohio & Mississippi	615	615	....	....	....	3,679,613	3,702,959	.....	23,346	0.6	5,983	6,021	....	38	0.6
Ohio Southern	130	130	....	....	....	479,033	473,002	6,031	.....	1.3	3,685	3,638	47	....	1.3
Peoria, Dec. & Ev.	254	254	....	....	....	733,412	759,767	.....	26,355	3.5	2,887	2,991	....	104	3.5
Pitts. & Lake Erie	71	71	....	....	....	1,201,312	1,193,521	7,791	.....	0.7	16,934	16,810	124	....	0.7
St.L.,Alton & T. H:															
Main Line	195	195	....	....	....	1,252,943	1,323,926	.....	70,983	5.4	6,425	6,789	....	364	5.4
Belleville Line	138	138	....	....	....	761,503	741,150	20,353	.....	2.8	5,518	5,371	147	....	2.8
Wab., St. L. & Pac.	2,942	3,198	....	256	8.0	13,845,686	14,911,063	.....	1,065,377	7.1	4,706	4,663	43	....	0.9
Total, 21 roads	11,854	12,110	....	256	....	75,959,541	79,533,721	620,099	4,194,279	.	6,408	6,568	....	160	....
Total inc. or dec.	.....	.... .	...	256	2.1	.....	.....	.....	3,574,180	4.4	.....	.....	....	160	2.4
NORTHWESTERN ROADS.															
Bur.,Ced.Rap.&No.	971	743	228	...	30.8	3,093,514	2,796,459	297,055	.....	10.6	3.186	3,764	.	578	15.3
Central Iowa	500	500	....	....	....	1,305,265	1.448,258	.....	142,993	9.9	2,610	2,896	...	286	9 9
Chi. & Alton	850	850	....	....	....	7,989,734	8,709,274	.....	719,540	8.3	9,400	10.246	...	846	10,3
Chi., Mil. & St. P.	4,860	4.778	82	...	1.7	24,410,959	23,470.998	939,961	.....	4.0	5,023	4,912	111	....	2.3
Chi. & N. W.	3,840	3,767	73	...	1,9	24,308,761	23,491,898	816,863	.....	3.5	6,330	6,236	94	....	1.5
Chi., St. P., M. & O.	1,318	1,297	21	....	1.6	5,818,263	5,781,832	36,331	.....	0.6	4,414	4,458	...	44	0.9
Des Moines & Ft. D	138	138	....	....	....	382,420	354.032	28,388	.....	8.0	2,771	2,565	206	....	8.0
Ill. Cent., Iowa lines	402	402	....	....	....	1,678,336	1.712,391	.....	34,055	2.0	4,175	4,260	...	85	2.0
Marquette, H. & O.	149	127	22	....	17.3	827,852	820,354	7,498	.....	0.9	5,556	6,459	...	903	14.0
Mil., L. S. & W.	500	384	116	....	30.5	1,333,392	1,114,316	219,076	.....	19.6	2,667	2,902	...	235	8.1
Mil. & Northern	227	227	....	....	....	558,330	520,443	37,887	.....	7.3	2,460	2,293	167	....	7.3
Wisconsin Central	440	440	....	....	....	1,427.495	1,395,258	32,237	.....	2.3	3,244	3,171	73	....	2.3
Total, 12 roads	14,195	13,653	542	....	....	73,134,321	71,615,613	2,415,296	896,588	....	5,152	5,246	....	94	1.8
Total inc. or dec.	. .....	.....	542	....	3.9	.....	.....	1,518,708	.....	2.1	.....	.....	....	....	....
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	2,940	2,408	532	....	22.2	8,351,558	5,750,522	2,601,036	.....	45.2	2.841	2,388	453	....	19.0
Northern Pacific	2,567	2,441	126	..	5.2	11,349,699	12,613,305	.. ..	1,263,606	10.0	4,421	5,167	....	746	14.3
St. P. & Duluth	227	227	....	....	....	1,383,183	1,317,315	65,868	.....	5.0	6,093	5.803	290	...	5 0
St. P., Minn. & Man	1,435	1,385	50	....	3.6	7,490,320	8,314,197	.....	823,877	9.9	5,220	6,003	....	783	13.1
Total, 4 roads	7,169	6,461	708	..	....	28,574,760	27,995,339	2,666,904	2,087,483	....	3,986	4,333	....	347	....
Total inc. or dec.	.....	.....	708	...	10.9	.....	.....	579,421	.....	2.1	.....	... ..	.	347	8.0
SOUTHWESTERN ROADS.															
Ft. Worth & Den.	132	110	22	....	20.0	464,173	463,568	605	.....	0.1	3,517	4,214	....	697	16.6
Gulf, Col. & S. F	550	536	14	....	2.6	1,826,761	1,727,595	99,166	.....	5.7	3,321	3,223	98	....	3.1
K. C., Ft. S. & Gulf	389	389	....	..	....	2,514,107	2,422,443	91.664	.....	3.8	6,463	6,227	236	....	3.8
Kan. C. Spr. & Mem	282	282	....	....	....	1,503,873	1.204,274	299,599	.....	24.8	5.333	4,270	1,063	....	24.8
St. L., Ft. S. & W.	204	165	39	....	23.0	647,331	503,040	144,291	.....	28.7	3,173	3,049	124	....	4.1
St. L. & San Fran.	804	766	38	....	4.9	4,389,428	4.643,596	.....	254.168	5.5	5,459	6,062	..	603	9.9
Texas & St. Louis	735	735	....	....	....	1.237.358	1,040,033	197,325	.....	19 0	1,683	1,415	268	...	19.0
Vicks., Sh. & Pac.	170	140	30	....	21.4	449.581	292.842	156.739	.....	53.5	2,645	2.092	553	....	26 3
Total, 8 roads	3,266	3,123	143	....	....	13,032,612	12,297,391	989.389	254.168	...	3,990	3,938	52	....	....
Total inc. or dec.	.....	.....	143	....	4.6	.....	.....	735,221	.....	5.9	.....	.....	52	....	1.3
FAR WESTERN AND PACIFIC ROADS.															
Denver & R. G.	1,317	1,317	....	...	....	6,111,361	5,552,104	559.257	.....	10.1	4,643	4,216	427	....	10.1
Denv. & Rio G. W.	368	368	....	....	....	1,014.095	864,716	149,379	.....	17.4	2,756	2.350	406	....	17.4
Union Pacific	4,500	4,420	80	....	1.8	25,925,171	25,657.290	267,881	.....	1.0	5,761	5,805	..	44	0.8
Total, 3 roads	6,185	6,105	80	....	....	33,050,627	32,074,110	976,517	.....	....	5,344	5,254	90	..	....
Total inc. or dec	.....	.....	80	....	1.3	.....	.....	976,517	.....	3.0	.....	.....	90	..	1.7
GRAND TOTAL:															
Total, 90 roads	65,874	64,306	1,860	292	....	435,750,732	444,932,300	9,157,497	18,339,065	....	6,615	6,919	..	304	....
Total inc. or dec.	. ....	.....	1,568	....	2.4	.....	.....	.....	9,181,568	2.1	.....	.....	....	304	4.4

the second section of the broken train, which was not coupled to the rear engine, had been gathering momentum on the incline, and as the forward cars slackened, raced down the track and dashed into the runaways with terrific force.

"The cars left the track in every direction, and, striking out left and right, scattered the débris of half a dozen building fronts along the narrow street. The greatest destruction was at Poplar street and the levee. In an angle formed by the branching of the tracks north and south was a one-story brick office, owned by the Bonsack Lumber Co., and occupied by John Clayton, who carries on the business of furnace setting. Clayton was asleep when the accident occurred. A box-car, loaded with lumber, left the track at the switch, and striking the building, sent walls and roof flying out into the levee. Clayton awoke to find himself in the midst of a shower of bricks and broken timbers, and with the stars shining down on his face. How he got out, he says, he does not know, but he escaped alive and with only a few slight cuts on the face and head.

"The destructive box-car was followed by a flat, a grain car and a long line of loaded coal gondolas. The box car jauntily skipped across the débris of the building, and, turning end up, struck on its nose in the mud; the grain car broke loose, rolled down the levee, and, rolling over on its side, broke square in half; the platform car jumped out of its wheels and a coal car rolled down to the edge of the river and stopped for want of rollers. The engine escaped uninjured, but when the runaway train was finally stopped, Poplar street looked like a coal yard struck by a cyclone. Half a dozen wrecked coal cars had scattered their freight along the street and sidewalk. A shed at Main and Poplar streets, owned by the Bonsack Lumber Co., was wrecked; a hole in the side wall of the Bridge & Beach iron foundry would have admitted a whole train of cars; a cart-load of bricks was lying on the floor of a bedroom on the first floor of the Mississippi House, on the opposite corner, owned by Frank Mitchell, the lumberman, and rented by John Girard. The bulk window and front wall of Charles Williams' saloon, No. 115 Poplar street, was shaved almost clean, two telegraph poles were cut off and hung suspended from the wires, and the owners of several other houses will need new steps. The loss will amount to between $15,000 and $20,000."

A Brakeman's Experience.

"The most interesting episode in my life," said a brakeman, "was a short ride I took under a stock car, much against my inclination. I was making a coupling between engine and train when the car started to move. I started to move also, but after taking several steps backward I found they moved faster than I did, so I went under. I clutched at the air several times and performed several feats which an acrobat might envy—such as doubling up in a ball and turning over, etc. I caught hold of the brake rod and threw my leg around the journal. I experienced several sharp pains, and, thinking I was going to be killed, wondered if death would be hard. I thought of my family—wondered what they would do. I saw the fireman at the switch and shouted to him. When he saw me a scared look appeared on his face, and had not disappeared when the cars stopped and I was taken out. The happiest moments of my life were when I stepped on the earth and looked at where I had been. I felt as light as air and was satisfied to escape, even if I had to suffer, for life is doubly sweet when you have to run such narrow chances. So this is one episode in my life of great interest to me."—*Cincinnati Times-Star.*

She Knew What She Wanted.

As the morning train going west drew up at Brighton the other day, an old lady with the legendary satchel was helped aboard the coach by the brakeman. Instead of entering it she passed into the smoking-car and took a seat. Pretty soon the brakeman put his head into the door and called out:

"Madam, this is the smoking car."

"Yes," she replied, as she investigated her satchel.

"The rear coach is for ladies."

"Yes."

As she made no move toward changing cars, the official stepped up to her and said:

"Madam, the next coach is for ladies."

"I know it," she replied.

"This is the smoking-car."

"Don't I know it!" she snapped, "and didn't I come in here to take a smoke! Do you suppose I haven't traveled enough to know what car to get into when I want to raise the wind off my stomach with a few whiffs at the pipe!"

She leaned over and took a lighted cigar from the man ahead, touched off her pipe, and after blowing out a few whiffs of blue smoke, she quietly observed:

"That's why I never travel on an accommodation train. It never has no decent place to smoke in."—*Detroit Free Press.*

Baggage Robbers Caught.

A dispatch from Fort Wayne, Ind., Feb. 3, says: "For six months past complaints have been coming into the baggage departments of the railroads centring at Auburn Junction, near here, alleging loss of valuables from trunks and valises. In settlement of these claims the Baltimore & Ohio Co. alone has paid out over $1000. Detectives were put on the case, and by marked parcels they succeeded in locating the thieves. Last night the city was astonished by the arrest of C. M. Keck, the joint agent at the Junction, and J. B. Barnett, the telegraph operator, both well known in society. They were arrested at the instance of the roads on bench warrants charging them with the robbery of several thousand dollars' worth of valuables. Their method was to open trunks by means of false keys, and after rifling them of all valuables, to relock them. The arrests were precipitated by the confession of Keck's mistress, who is a servant in Barnett's family. Much of the stolen property was recovered in Barnett's house, and is now held for identification."

A Singular Accident.

A dispatch from Chillicothe, Mo., Feb. 3, says: "Last night about 8 o'clock while a west-bound freight train on the Hannibal & St. Joseph Railroad was standing on the side track here the lubricator in the cab of the engine exploded, sending the hot tallow full into the faces of the engineer, fireman and head brakeman, who were seated in the cab. Engineer Samuel Moore and Fireman T. F. Carey were terribly burned, the latter's ears being burned to a crisp. Brakeman William O'Toole was also severely burned. The injured men were taken to Brookfield."

Running Without a Truck.

The Grand Rapids (Ind.) *Telegram* of Feb. 3 says: "A long freight train arrived in this city on the Grand Rapids & Indiana Railroad on Monday night, when it was discovered that one truck was missing from under a box car in the middle of the train. The lost truck was found at Martin, about 30 miles from the city, and the car had been dragged the whole distance without the accident having been discovered. Singularly enough the truck had jumped from the track without causing any perceptible jar."

Speed.

"Pa," inquired a little Harlem boy, "is there anything quicker than lightning?"

"Oh, yes," the old man replied, "the style in which the Second and Ninth avenue elevated roads were started again was a good deal quicker than lightning."—*New York Times*

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE LAST YEAR'S EARNINGS.

Our table of earnings for the calendar year has reports from 90 different railroads, whose aggregate mileage and earnings and average earnings per mile were :

	1885.	1884.	Inc. or Dec.	P.c
Miles	65,874	64,306	+ 1,568	2.4
Earnings	$435,750,732	$444,932,300	— $9,181,568	2.1
Earn. per mile	6,615	6,919	— 304	4.4

The list includes a few roads which do not report monthly, among them the very important New York Central & Hudson River. The mileage was about 52 per cent. of the total mileage worked. That it fairly represents the general course of earnings in the country is probable, but not certain, as the 48 per cent. not reporting may have been better or worse than the 52 per cent. reporting. For the year covered in the last Poor's Manual, which included all reports made for the calendar year 1884, many for the year to Sept. 30 previous, and a considerable number for a year to some month in 1885, but averaging probably as early as Dec. 1, 1884, it reported the aggregate earnings of 113,173 miles of railroad, while we have them for 64,306 miles for the exact calendar year 1884. The Manual gave $763,306,608 as the gross earning, or $6,744 per mile of road; we have $444,932,300, or $6,919 per mile. This indicates that the roads from which we have reports have very little more than the average earnings, and increases the probability that our table represents the average course of earnings in 1885, namely, a decrease of 2.1 per cent. in the total and of 4.4 per cent. in the average per mile. It should be remembered that our table last year showed, for 84 roads, a decrease of 3.7 per cent. in total earnings and 8.6 per cent. in earnings per mile from 1883 to 1884, and that Poor's Manual for the whole United States system showed a decrease of 5.4 per cent. in the total and 10.7 per cent. in earnings per mile. Thus 1885 was the second year that earnings had decreased, and the indications are that the total earnings of the whole railroad system of the United States in 1885 were about $60,000,000 less than in 1883, notwithstanding an increase of 9,000 miles of road worked, and that the earnings per mile have fallen from $7,553 to about $6,447—certainly a very serious change.

Where the losses have been greatest, we shall see below.

Three railroads in the Far West, south of the Northern Pacific, report :

	1885.	1884.	Increase.	P.c.
Miles	6,185	6,105	80	1.3
Earnings	$33,050,627	$32,074,110	$976,517	3.0
Earn. per mile	5,344	5,254	90	1.7

These three roads all gained in total earnings, and all but the Union Pacific gained in earnings per mile, the Denver & Rio Grande 10 and the Denver & Rio Grande & Western 17½ per cent.

Northwest of St. Paul the four roads reporting had :

	1885.	1884.	Inc. or Dec.	P.c
Miles	7,169	6,461	+ 708	10.
Earnings	$28,574,760	$27,995,339	+ $579,421	2.
Earn. per mile	3,986	4,333	— 347	8.

Nearly half of the whole increase of mileage of the 90 roads was by this group, and chiefly by the Canadian Pacific. Both the Northern Pacific and the Manitoba had a decrease of 10 per cent. in total earnings, in spite of their larger mileage. The Northern Pacific, however, had abnormally large earnings in 1884. This is the only group which had an important increase in mileage. It is situated where until recently the growth of the country was most rapid.

Northwest of Chicago 12 roads report :

	1885.	1884.	Inc. or Dec.	P.c.
Miles	14,195	12,653	+ 542	3.9
Earnings	$73,134,321	$71,615,613	+ $1,518,708	2.1
Earn. per m.	5,152	5,246	— 94	1.8

Of these roads only the Central Iowa, the Chicago & Alton and the Iowa lines of the Illinois Central had a decrease in total earnings last year, but besides these the Burlington, Cedar Rapids & Northern, the St. Paul & Omaha, the Marquette & Ontonagon, and the Milwaukee, Lake Shore & Western had a decrease in earnings per mile—some of them very large—and there were no large gains. In 1883 the same 12 roads together earned $73,414,411 from 12,945 miles, or at the rate of $5,680 per mile, against $5,152 this year. With 1,250 more miles of road they have earned $280,090 less money.

The group west and southwest of St. Louis is intended to include the roads south of the Missouri River and the Atchison, Topeka & Santa Fe Railroad, and west of the Mississippi, but the Gould system includes the larger part of these, and they have not reported for last year. The eight which do report show :

	1885.	1884.	Increase.	P. c.
Miles	3,266	3,123	143	4.6
Earnings	$13,032,612	$12,297,391	$735,221	5.9
Earn. per mile	3,990	3,938	52	1.3

All of these but the St. Louis & San Francisco have an increase in total earnings, though the Fort Worth & Denver has a large decrease in earnings per mile. The Texas roads generally had a decrease in the first half of the year, but have made gains since. The most notable change is the increase of 24¼ per cent. by the Kansas City & Memphis, whose earnings per mile in this, its second year, were above the average of railroads northwest of Chicago, 6 per cent. more than the Milwaukee & St. Paul's, 2 per cent. greater than those of the old Richmond & Danville, an eighth more than those of the South Carolina, which is nearly the oldest railroad in the country, and 16 per cent. more than those of the Memphis & Charleston, a main eastern outlet of the city from which the Kansas City & Memphis extends northwestward.

So far we have found in every group some increase in total earnings, and we have covered the lines west of a line from Chicago to St. Louis and west of the Mississippi further south. Altogether these Western roads show :

	1885.	1884.	Inc or Dec	P.c.
Miles	30,815	29,342	+ 1,473	5.0
Earnings	$147,792,320	$143,982,453	+ $3,809,867	2.6
Earn. per mile	4,796	4,907	— 111	2.2

The increase in earnings was not in proportion to mileage, it is true, but it was considerable, and the decrease in the average earnings per mile was but small. Before taking up the separate groups further east, we will compare their aggregates—all east of a line from Chicago to St. Louis and of the Mississippi further south—with the above, as follows :

	1885.	1884.	Decrease.	P.c.
Miles	35,059	34,964	95	0.1
Earnings	$287,959,412	$300,949,847	$12,991,435	4.3
Earn. per mile	8,214	8,608	394	4.6

Thus, the Eastern roads, with but one-seventh more railroad than the Western roads, earned nearly twice as much money last year and more than twice as much in 1884, their earnings per mile being $802 in 1885, against $480. But the Eastern roads lost nearly $13,000,000 in earnings, while the Western roads gained $3,800,000, and the earnings per mile of the Eastern roads decreased 4.6 per cent.; of the Western, 2.2 per cent.

This shows that while last year was unfavorable to many Western railroads, as the year before had been, the losses of the year fell chiefly on the lines east of Chicago, St. Louis and the Mississippi River, and, as we shall see below, on that part of them north of the Ohio and Potomac rivers—just the territory affected by the trunk line railroad was, though we would not wish to convey the impression that the falling-off in earnings was wholly due to that contest. This section is the seat of by far the larger part of the manufacturing industries of the country, and these industries for two years past have been especially unprosperous.

In the South east of the Mississippi and south of the Ohio and the Potomac 23 roads report :

	1885.	1884.	Inc. or Dec.	P. c.
Miles	11,128	10,924	+ 204	2.0
Earnings	$51,699,184	$51,758,432	— $59,248	0.1
Earn. per mile	4,646	4,738	— 92	1.9

The changes in the aggregates are small, but unfavorable. Nine of the 23 roads had some decrease in total earnings, and 12 had a decrease in earnings per mile. The large percentages of gain or loss are chiefly by roads of light earnings. The more important are an increase of 14 per cent. by the Chesapeake, Ohio & Southwestern (Paducah to Memphis) and one of 16½ by the New Orleans & Northeastern; and a decrease of 11.7 by the Southern Division of the Illinois Central, 15½ by the Kentucky Central, and 11.7 by the Nashville & Chattanooga. Generally the Southern roads gained in the first half of the year and lost after August. They did not do very well in 1884, and the mileage and earnings of 21 of them for three years have been :

	1883.	1884.	1885.
Miles	10,036	10,326	10.518
Earnings	$50,450,635	$49,729,568	$49,679,992
Earnings per mile	502	482	472

The decrease since 1883 is $750,000 (1½ per cent.) in the total, and 6 per cent. in earnings per mile. This has been less than in the North.

The 21 roads reporting north of the Ohio River, west of Pennsylvania, and east of the Chicago & Alton Railroad, had the following aggregates :

	1885.	1884.	Decrease.	P.c.
Miles	11,854	12,110	256	2.1
Earnings	$75,959,541	$79,533,721	$3,574,180	4.4
Earn. per mile	6,480	6,568	160	2.4

A portion of the decrease in earnings was due to the dropping of a part of the Wabash system, but only a small part, for the lines dropped had exceptionally light earnings. Of the 21 roads in this group only eight had any increase in earnings, and the increases were all small, the largest being 7.5 per cent. by the Eastern Illinois and 5.7 by the Illinois Central's Illinois lines. The Michigan roads had the largest decreases.

These roads had a very serious decrease of earnings in 1884, and 19 of them have had for the last three years :

	1883.	1884.	1885.
Miles	11.545	11,132	10,876
Earnings	$81,375,667	$70.148,093	$67,154,079

Thus the decrease in earnings in two years has been no less than $14,221,000, or 17½ per cent., $3,063,000 of which was by the Wabash, but probably not more than half of it attributable to its decrease in mileage. The table is more significant than usual, because it includes the Lake Shore and the Michigan Central. Of the whole decrease from 1883 to 1885, no less than $7,680,000 was by these two roads; other lines with a large through traffic, which do not report, have doubtless suffered almost as much as these, so that a very serious reduction in earnings has characterized this whole group for two years past.

We now come to the Eastern group, which this time has reports from all the great trunk lines except the Baltimore & Ohio, the 19 roads having in the aggregate :

	1885.	1884.	Inc. or Dec.	P. c.
Miles	12,077	11,930	+ 147	1.2
Earnings	$160 299,687	$169,657,694	— $9,358,007	5.5
Earn. per mile	13,273	14,221	— 948	6.7

This is the worst showing of all, the decrease in the earnings of these 12,077 miles of road being somewhat more than the aggregate decrease of the entire 65,874 miles reporting. Nearly all of it has fallen on the trunk lines and the Reading, the greatest percentages of decrease being 10.7 by the Grand Trunk, 9.5 by the New York Central, and 6.1 by the Pennsylvania. Nine of the 19 Eastern roads had some increase in earnings, but the gains of all nine together were not one-third of the Grand Trunk's decrease, and about one-sixth of the Pennsylvania's. The most important gain was 8 per cent., by the Baltimore & Potomac.

Ten of these roads which reported from 1883 had a very serious decrease in 1884, and for three years have had :

	1883.	1884.	1885.
Miles	7,901	8,459	8,606
Earnings	$116,148,350	$112,009,413	$105,826,364
Earnings per mile	14,700	13,240	12,293

Thus these 10 roads earned 9 per cent. less in the aggregate and 16½ per cent. less per mile than in 1883, the decrease from 1883 to 1884 being $4,139,000, and that from 1884 to 1885 $6,183,000.

The turn in the course of earnings in the last three or four months of the year did not come soon enough to prevent its being a very bad year for the roads east of the Mississippi and north of the Ohio, and these lines must have a very great improvement to enable them to do as well as in 1883, which was for them generally a favorable year, though not so profitable as one or two earlier ones.

TRAIN ACCIDENTS IN 1885.

The record of train accidents published from month to month during the year just closed has contained brief notes of 464 collisions, 681 derailments and 72 other accidents; a total of 1,217 accidents, in which 307 persons were killed and 1,530 injured. The record of train accidents in our columns has now been kept for that period, and the table accompanying this article presents in a condensed form a statement covering

TRAIN ACCIDENTS—THEIR NATURE AND CAUSES FOR THIRTEEN YEARS.

	1885.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.
COLLISIONS:													
Rear	316	280	413	388	366	274	206	142	159	159	141	131	187
Butting	120	138	177	160	146	141	86	70	96	94	104	87	102
Crossing	28	27	39	30	24	22	17	7	13	15	18	19	31
Unknown	....	..	....	.	..	....	1	1	....	11	15	23	72
Passing	....	....	....	3	....	....	....	....	....	....	....	....	....
Total collisions	464	445	630	581	536	437	310	220	268	279	278	260	392
DERAILMENTS:													
Broken rail	102	60	84	37	85	45	56	17	46	50	107	42	111
Loose or spread rail	65	68	88	72	29	21	19	29	41	43	40	16	13
Broken bridge or trestle	32	34	35	38	44	16	17	21	21	20	26	33	19
Broken or defective switch	13	9	12	2	5	5	2	1	6	4	15	12	10
Broken or defective joint	..	..	1	3	4	..	..	2	2	1	10	5	3
Broken or defective frog	11	11	7	4	2	2	..	2	2	3	8	8	4
Bad track	....	..	.	..	..	..	..	..	..	4	..	13	7
Total defects of road	223	182	227	156	169	89	94	72	118	125	206	129	167
Broken wheel	41	22	40	33	58	21	21	5	12	22	33	20	26
Broken axle	48	30	60	52	50	30	30	18	43	38	39	20	21
Broken truck	18	12	24	14	10	7	11	13	8	10	15	8	7
Failure of coupling or draw-bar	6	3	2	..	..	1	2	4	1	1	3	7	8
Broken parallel or connecting-rod	....	..	..	1	1	2	..	.	..	..	5	.	..
Broken car	....	..	..	..	1	3	..	1	1	2	3	..	..
Loose wheel	..	..	3	1	4	..	2	..	1	3	2	4	2
Fall of brake or brake-beam	10	..	..	..	..	..	..	..	..	..	..	4	9
Broken tire	....	..	..	1	..	..	..	..	..	..	..	..	..
Total defects of equipment	123	67	129	102	124	64	66	41	66	76	100	63	73
Misplaced switch	55	82	89	90	85	80	80	48	70	89	81	67	72
Rail (or bridge) removed for repairs	4	2	9	2	12	4	4	5	7	7	8	7	16
Making flying-switch	....	2	4	..	1	1	..	..	..	2	4	1	..
Runaway engine or train	....	3	1	2	1	5	1	2	1	..	3	1	6
Running through siding	....	..	5	1	3	5	3	6	3	6	2	3	3
Open draw	5	5	4	6	2	1	2	4	4	3	2	6	4
Careless stopping and starting	...	..	..	.	..	1	..	..	..	..	..	3	..
Overloading car	....	..	..	..	..	..	..	..	..	1	..	3	..
Bad switching	....	..	..	..	..	..	..	..	..	..	..	2	..
Total negligence in operating	64	94	112	101	104	98	90	65	85	108	100	93	101
Cattle on track	25	28	45	48	42	43	35	30	43	46	51	45	54
Snow or ice	30	7	13	5	15	8	22	13	25	16	36	13	9
Wash-out	22	25	25	23	18	17	11	36	17	40	44	10	30
Land slide	7	18	16	7	14	4	7	4	11	9	11	..	..
Accidental obstruction	17	42	53	37	45	25	24	26	22	36	37	51	44
Malicious obstruction	15	12	12	17	13	8	11	15	11	11	21	22	11
Wind	6	3	19	5	3	3	3	1	2	2	7	..	..
Man on track	....	..	..	2	..	..	..	.	..	..	..	..	2
Flood over track	....	..	..	..	..	..	..	..	..	..	..	..	2
Rail or switch purposely misplaced	13	17	16	..	..	..	..	..	..	..	..	..	..
Total unforeseen obstructions	135	152	199	144	150	108	113	125	131	166	207	141	152
Others (1 each)	....	....	....	....	....	1	2	3	4	1	5	10	7
Unexplained	136	186	259	238	310	237	192	175	177	185	222	218	315
Total derailments	681	681	926	742	857	597	557	481	581	655	840	655	815
ACCIDENTS WITHOUT COLLISION OR DERAILMENT:													
Boiler explosions	11	16	13	12	14	14	17	11	15	19	26	14	16
Cylinder explosions	....	2	5	1	1	3	1	1	..	3	3	6	3
Broken parallel or connecting rod	28	17	26	11	21	13	15	11	13	7	14	8	11
Broken axle	2	7	8	4	1	3	1	..	1	2	13	..	..
Cars burned while running	9	13	13	7	8	6	4	13	7	11	10	16	2
Broken wheel	8	4	7	1	20	..	..	..	..	..	..	..	.
Broken tire	1	..	1	1	..	..	3	..	1	..	9	..	..
Other breakages of rolling stock	6	2	7	3	..	1	2	2	4	4	8	16	19
Failure of bridge or trestle	....	..	..	..	..	..	..	..	..	..	..	2	..
Mass falling on running train	2	..	2	..	..	..	..	..	1	1	..	2	2
Accidental obstruction	....	2	2	..	..	3	..	..	..	..	..	..	11
Malicious obstruction	2	..	..	..	..	1	..	1	..	..	1	..	3
Other causes (1 each)	3	2	2	..	..	..	..	..	..	..	..	2	9
Total without collision or derailment	72	65	84	42	65	44	43	39	42	48	83	66	76

RECAPITULATION.

Collisions	464	445	630	581	536	437	310	220	268	279	278	260	392
Derailments	681	681	926	741	587	597	557	481	581	655	840	654	815
Other accidents	72	65	84	42	65	44	43	39	42	48	83	66	76
Total	1,217	1,191	1,640	1,364	1,458	1,078	910	740	891	982	1,201	980	1,283

the 13 years, the accidents being classed therein according to their nature and causes.

This record includes accidents to trains only, with the death and injuries resulting therefrom, and takes no account of the large number of accidents to persons at road crossings, at stations or while walking on the track, nor of the many cases of injuries to railroad employés in coupling cars and other yard work, or on the road, when such injury does not result directly from an accident to a train.

As we have often stated before, this record is not in any sense official, and does not, and indeed in the nature of things cannot, pretend to be complete. It is to a great extent compiled from newspaper exchanges, a large number of which, from all parts of the country, are carefully searched for this purpose. This information is supplemented, wherever possible, from other sources, which are of great service in proving the correctness of the record. In the absence of any general authority to require reports of accidents from railroad companies, a complete record is an impossibility, however desirable it may be. Several of the states do now require such reports, but the information furnished to state commissioners is only in rare cases available until long after the accidents have occurred, in most cases not being made public until the annual report of the commission appears. Without doubt there are a large number of accidents which are not included in our record. Accidents occurring to passenger trains, those resulting in any considerable delay or derangement of traffic, and those causing loss of life or serious injury to persons, are pretty sure to be reported; but a great number of slight accidents to freight trains, derailments, rear collisions, etc., are pretty sure to escape notice, especially where they do not happen to delay passenger trains or to make necessary a call for the wrecker from division headquarters. Nevertheless, those actually recorded are sufficiently numerous to offer a fair indication of the general course of railroad management in this respect.

The number of accidents recorded in each month of the 13 years has been:

	1873.	1874.	1875.	1876.	1877.	1878.	1879.
January	178	108	131	69	147	75	113
February	133	90	211	91	56	67	88
March	112	88	122	109	58	49	61
April	101	59	60	56	69	46	50
May	79	89	54	64	46	50	37
June	90	83	61	52	49	56	64
July	90	64	73	79	53	54	81
August	150	73	114	78	98	75	79
September	106	89	116	106	84	76	78
October	88	81	88	103	82	61	104
November	76	82	87	96	83	68	86
December	80	74	84	88	66	63	69
Year	1,283	980	1,201	982	891	740	910

	1880.	1881.	1882.	1883.	1884.	1885
January	62	223	137	168	147	145
February	64	149	89	184	110	216
March	65	113	99	142	115	86
April	71	63	81	106	88	81
May	46	85	94	120	76	62
June	56	73	72	91	71	75
July	78	102	92	119	89	76
August	112	129	139	144	89	92
September	124	144	153	158	100	91
October	120	131	136	174	105	123
November	145	133	125	122	96	96
December	135	113	148	112	105	74
Year	1,078	1,458	1,365	1,640	1,191	1,217

The year just closed is no exception to the rule noted in previous years, that the number of accidents is directly influenced by the weather. This, indeed, is so obvious as hardly to need remark, and is plainly shown by the table above. In 1885 there is a most marked contrast between the stormy months of January and February and the mild December, and in previous years the mild and severe winters can readily be picked out by a glance over the table.

How much the weather affects one important class of accidents, those resulting from broken rails, is shown by the following table, compiled from the record:

Accidents from Broken Rails in the First and Third Quarters of the Calendar Year for 13 years:

Year.	Quarter. First.	Quarter. Third.	Year.	Quarter. First.	Quarter. Third.
1873	65	5	1881	58	13
1874	20	5	1882	10	4
1875	90	3	1883	58	4
1876	26	5	1884	38	3
1877	26	7	1885	67	8
1878	7	2			
1879	34	5	Thirteen years	506	71
1880	7	7	Average	39	5½

The contrast shown here is very marked, not only between the first and third quarters in each year, but between the winter months of successive years, and the result does not seem to have been much affected by the great increase in the mileage of steel rails which has taken place during the 13 years.

It will be observed from the table that while the railroad mileage of the United States has increased nearly 80 per cent. during the 13 years in which this record has been kept, the number of accidents last year was actually less than in 1883. While, as stated above, it is not claimed that the number reported is nearly that of the whole number occurring, there is no doubt that it bears a certain relation to the actual number, and it is altogether probable that the railroads last year were operated with less trouble and loss from accident than they were 13 years ago. How far this was due to improvements in track and equipment, to a more general use of signal apparatus and to better methods of management, many of our readers are competent to judge.

One point to which attention has been called in previous summaries is, that the years of active railroad construction have been years of many accidents. This fact does not lack easy and natural explanations, chief among which are the usual imperfections of new and hastily built track and the unavoidable employment of many inexperienced men in railroad service.

The accidents recorded last year are divided, according to their nature and the classes of trains, as follows:

Accidents:	Collisions.	Derailments.	Other.	Total.
To passenger trains	47	247	51	345
To a passenger and a freight	102	....	..	102
To freight trains	315	434	21	770
Total	464	681	72	1,217

Allowing two trains in each collision, this shows accidents to a total of 1,681 trains, of which 494, or 29 per cent., were passenger trains, and 1,187, or 71 per cent., were freight trains. For the reasons elsewhere stated, this is probably somewhat less than the true proportion of freight train accidents.

The most frequent cause of collision noted last year was the breaking of trains in two; next in order were the failure to signal following trains promptly and misplaced switches. The first-named cause is in great part the fault of those who have in charge the design and construction of the rolling stock, and who have not, perhaps, made sufficient allowance for the strains imposed upon the draw-gear of cars by the use of heavier locomotives and longer trains; the others might, in part at least, be prevented by greater strictness in discipline and more careful instruction of trainmen.

The casualties caused by the different classes of accidents for seven years have been:

Killed:	In collisions.	In derailments.	In other acc.	Total.
1885	158	141	8	307
1884	172	192	25	389
1883	227	229	17	473
1882	177	200	3	380
1881	200	190	15	414
1880	156	143	16	315
1879	94	97	4	185
Injured:				
1885	547	963	20	1,530
1884	624	1,092	74	1,760
1883	716	1,145	49	1,910
1882	578	975	35	1,588
1881	565	905	37	1,507
1880	412	714	46	1,172
1879	286	389	34	709

Of the 1,217 accidents reported last year 193 caused the death of one or more persons each, while 282 caused injury to persons but not death; a total of 475 accidents, leaving 742, or 61 per cent. of the whole number, in which there was no injury to persons considered serious enough for record.

In proportion to their relative number, the collisions may be said to be more fatal in their results than the derailments. As a rule, trainmen are more liable to receive injury in a collision, and their chances of escape are less than in the average derailment. On the other hand, it may be accepted as a general rule that more passengers are hurt in derailments than in collisions, except in the comparatively rare case of a rear collision of passenger trains. These rules are

very general, however, and many exceptions to them will be noted.

For three years past the persons killed and injured are classed as follows:

	Killed.			Injured.			Totals.		
	Pass.	Emp.	Total.	Pass.	Emp.	Total.	Pass.	Emp.	Total.
1885...	85	222	307	617	913	1,530	702	1,135	1,837
1884...	89	300	389	1,016	744	1,760	1,105	1,044	2,149
1883...	132	341	473	979	931	1,910	1,111	1,272	2,383

Of the total number of killed last year employés constituted 72 per cent.; of the injured they formed 59½ per cent., and of the total number of casualties 67¼ per cent. In this classification there are included under passengers all persons not railroad employés on duty, so that tramps stealing a ride form a small portion of the number thus classed as passengers.

There is some reason for believing that improved methods of construction and operation are gradually, if very slowly, decreasing the number of accidents. That systems and apparatus cannot always be depended on to prevent accident, however, we have occasionally striking evidence. One of the worst accidents of last year, for instance, occurred on a road which is provided with one of the best systems of signals, and on which every precaution is taken, and was due entirely to the failure of a signal operator to act at the proper time. The momentary forgetfulness of the man made the machine wholly useless at a time when it was especially needed. That all accidents can be prevented is not to be hoped for; but there is still very great room for improvement, and it is evident to all who are familiar with the subject, that a large proportion of the train accidents belong to the class which might and ought to be prevented. It is to reduce this proportion that the efforts of many efficient railroad managers are constantly directed.

NEW YORK GRAIN RECEIPTS.

The receipts of grain of all kinds, including flour reduced to bushels, at New York for the last two years have been:

	1885.	1884.	Increase.	P. c.
Bushels.....	126,637,431	115,420,066	11,217,365	10.0

The gains and losses by the several routes last year compared with 1884 were:

The New York Central gained....	5,193,000 bu.	= 17	p. c.
The Erie "	5,003,000 bu.	= 25	p. c.
The Pennsylvania "	4,247,000 bu.	= 38¼	p. c.
The West Shore "	3,443,000 bu.	= 52½	p. c.
The Lackawanna "	5,000 bu.	....	...
The railroads together gained.....	17,892,000 bu.	= 23¾	p. c.
The coasting vessels gained.....	1,320,000 bu.	= 54½	p. c.
The canal lost.....	7,995,000 bu.	= 21	p. c.

The railroads thus took not only the whole increase in the receipts, but a good deal more. Their deliveries increased 24 per cent., while the canal's decreased 21 per cent. The railroads increased their proportion of the total receipts from 65 to 73½ per cent., while the canal's share fell from 32⅞ to 23⅝. In 1884 the canal brought 37 millions less than all the railroads together; in 1885, 63 millions less.

It need hardly be said that this was due to the railroads carrying at extremely low rates, not only while the canal was open, but before, causing immense shipments in the winter and spring months, which otherwise would have been held till they could be forwarded by canal. That, with rail rates so low, there still should have been nearly 30,000,000 bushels brought by the canal boats is more remarkable than that they should have lost so much. This is the first year that any one railroad has brought more grain to New York than the canals, the deliveries being 36,080,000 by the New York Central, against 29,931,000 by the canal.

The Lackawanna did not participate in the gain made by the railroads, probably having something better to do than to carry grain for 0.2 to 0.3 cent per ton per mile and haul the cars back empty. Aside from this, the percentages of gain were inversely proportional to the amounts carried by the several roads in 1884; that is, the road which carried most had the smallest percentage of gain, while the one which carried least had the largest percentage of gain. Thus the New York Central's increase was about one-sixth, the Erie's one-fourth, the Pennsylvania's three-eighths, and the West Shore's more than one-half.

The total receipts of grain and flour at New York by rail, by canal and by vessels from other ports on the coast, for ten successive years have been, in *millions* of bushels:

	Millions of bushels.				P.c. of total.	
	Rail.	Canal.	Coastwise.	Total.	Rail.	Canal.
1876...	59.0	32.7	4.2	95.9	61.5	34.4
1877.....	50.9	48 3	4.1	103.3	49.3	46.8
1878.....	85.4	63.9	3.6	152.9	56.0	41.9
1879.....	101.9	57.0	4.2	163.1	62.5	35.0
1880.....	95.4	69.5	4.2	169.1	56.4	41.9
1881.....	98.6	38.2	3.1	139.9	70.4	27.2
1882.....	79.8	32.1	2.5	114.4	69.7	30.3
1883.....	79 4	41.2	3.7	124.3	63.9	33.1
1884.....	75.1	37.9	2.4	115.4	65.0	32.9
1885.....	93.0	29.9	3.7	126.6	73.5	23.6

Though, as we have said, the railroads last year brought a larger proportion of the whole than ever before, the quantity they brought then was exceeded in 1879, 1880 and 1881, though not greatly exceeded, while the total receipts last year were greatly exceeded in those years. Thus in 1880 (when rail rates were well maintained at 30 to 40 cents per 100 lbs. from Chicago to New York) the total receipts were 36½ millions more, but the rail receipts only 2½ millions more than in 1885. Very low rail rates increased the rail receipts largely in 1876, 1879, 1881, and in the last two years, but most of all last year, when they were nearly three-fourths of the whole.

The proportion of canal receipts is modified considerably by the surplus produced in different parts of the country; the southern half of Illinois, Indiana and Ohio is not likely to send its grain to the East by way of a lake port; and when it has large crops of wheat and corn, the many millions it sends to the seaboard are likely to go almost entirely by rail. It had large crops in 1878, 1879 and 1880, and again in 1884, but it spares less now than formerly for shipment to the seaboard. When the crop is heavy there and light further north, even with rail rates maintained, the canal is sure to suffer; on the contrary, when the crops are light there (as the wheat crop was in 1885) and good further north, nothing but very low rates is likely to give the railroads a large share of the business. Last year an unusually large proportion of the wheat was produced in the country, which markets almost exclusively by way of some lake port, and this was favorable to the canal, but was neutralized by the low rates of the railroads. Wheat, however, has not played a very important part in the receipts for several months, and the corn comes from the more southern as well as the more northern territory.

In spite of the showing made above, by which it appears that the proportion of receipts by canal was smaller last year than ever before, and the amount of the canal receipts the smallest for ten years—for a much longer period, in fact—in spite of this, it is by no means certain that the canal has ceased to play an important part in the New York grain trade. Its receipts were made small last year only by a policy which the railroads cannot afford to persist in until they have learned how to reduce the cost of carrying considerably below what it is at present. There can have been only a very minute profit on the 93 million bushels which they brought to New York last year, and at 25 cents in winter and 20 in summer, which is about as low as they can afford to carry, the canal would take a considerably larger share of the business. Moreover, the growth of wheat production now is most rapid west of Lake Superior, and nearly all this wheat (unless ground in the West) is likely to go east by lake, which gives the canal boats the best opportunity to get it. Were the Manitoba wheat marketed by way of New York, this might add materially to the canal grain movement, but that goes almost entirely to Canada, and great efforts will be made to keep it there. The wheat-growing territory of the United States west of Lake Superior, though capable of a very considerably increased production, is of limited extent, never likely to produce as many bushels of grain as Iowa or Illinois, where 325 million bushels of corn have reinforced a crop of 50 millions of wheat.

What the canal has to fear is a small export movement, such as we have had recently. The railroads carry nearly all the grain required for the supply of interior points, and this has been a constantly increasing quantity, while the seaboard receipts and the exports have been decreasing. A very large part of the grain the railroads command so completely that it cannot be diverted from them, and so any reduction in the total receipts is likely to come chiefly from the canal. We see this in the difference between 1880 and 1882 (leaving 1881 out of consideration, because low rates made the rail business artificially large then). There was a decline in the total of 54.7 millions from 1880 to 1882; but the decrease by rail was only 15.6 millions (16⅓ per cent.), while the decrease by canal was 37.4 millions (54 per cent.)

But even very large exports, if they came suddenly, would not be likely to give the canal a heavy grain business at once. Several years of unprofitable business have discouraged the construction of canal boats, and were they offered next season the 69½ million bushels which they transported in 1880 they would not be able to carry it all. The railroads, on the other hand, have largely increased facilities, and there are five now, instead of the three which brought 102 millions to New York in 1879. This traffic, however, is but a small part of their total traffic, and with all other business active, they might find it not so easy as we might think to carry a great increase in grain—as we found them hard pressed last fall when the grain movement was only moderate. But a heavy season's business at profitable rates would, doubtless, cause both railroads and canal to provide all the facilities necessary for carrying more grain to New York than it has ever yet received.

American and Foreign Rails and Rail-joints.

Mr. C. P. Sandberg, of London, whose careful study of the rail and joint question and important contributions to good practice therein are remembered by all maintenance of way men, has recently presented a paper before the Institution of Civil Engineers on "Rail Joints and Steel Rails," the text for which is the "numerous articles, reports and correspondence in the *Railroad Gazette* during the year 1885;" chiefly those discussing breakages of fish-plates and soft or otherwise bad rails.

The paper is a very valuable one, and will be read by track men with general interest, especially as it is, as the author notes, "confined to a statement of observations in Europe," which the author reasonably hopes "may lead to an explanation of the phenomena observed in America, while at the same time it may serve as a warning to European railway managers to avoid the errors committed elsewhere."

We begin the publication of the paper this week, but will not forestall its complete publication by discussion of the suggestive facts brought out therein, further than to say that we imagine the author lays far too much stress on the fact that "*news from America* shows that fish-plates break frequently and steel rails wear badly," and that "the rails which have been found to wear badly are principally of American manufacture and the fish-plates are also exclusively of American make." The conclusion which Mr. Sandberg seems disposed to draw, that all our rails are in a very bad way, and all our joints are about to give up the ghost, is not justified by the facts, any more than the corresponding conclusion which other kindly foreigners have drawn from other newspaper discussions—that American political life is rotten to the core—is justified by the facts. This is a land of free discussion. Whatever our other defects as a people, we are, perhaps, over apt to "want to know, you know" the cause of any defect, political or mechanical, and to frankly talk it over, with scant attempt, or none at all, to put a good face on the matter and avoid possible misconception. That this is true in political matters every one knows. That it is true in mechanical matters a comparison of our columns with those of almost any foreign technical journal will show almost every week. Either in correspondence or in reports of technical meetings, it is a very common thing for railroad officers to point out that this, that or the other thing in their practice is not giving good results and to ask for explanations, while in most foreign journals it is the rare exception, at least as respects individuals. The German Railroad Union, for example, does a great deal of solid work, of a kind which ought to be done (but is not) in this country, but it is done in such a way as to give a fair average. Let every man in Germany who is individually dissatisfied growl, and every one who is satisfied keep silent, and the careless critic would get a very different idea, we imagine, of the good and bad of German railroad practice.

In this particular matter of rails, we fear there is no doubt that the *average* quality of all rails in use in America is not equal to the average of Europe, but that there is any great difference in the average we do not believe. That there should not be some difference would be little short of a miracle, not because our manufacturers are either unwilling or unable to turn out a good article, but because of the discreditable devil-may-carelessness of American *buyers*, who so generally neglect to establish proper standards of quality, and thus compel manufacturers not only to furnish the kind of rail which is wanted, but to find out for themselves what kind of a rail is wanted. It is not to be wondered at that makers have shown no great zeal or success in studying out the details of other men's business, and we believe it is but just to add that in no other country but this could such implicit reliance be shown as is shown in the skill and integrity of rail-makers—and of bridge-builders and car-builders and locomotive builders and a host of others as well—without far more disastrous results. All of which does not save it from being a very silly kind of negligence, from which, however (to avoid any further misconception) we will here add that many of our more prominent lines are quite free.

We notice, also, one serious error in Mr. Sandberg's treatment of the international phases of the rail question, and that is a very serious one, indeed, which may be appropriately noted in advance: that in comparing the usual weights of English and American rails he fails to consider the fact that cross-ties are laid less than 2 ft. apart in this country, whereas they are 3 ft. apart in England. When the effect of the additional stiffness thus gained is considered, the false and deceptive character of conclusions drawn from a bald

comparison of the weights per yard alone becomes at once evident. With ties 3 ft. apart a rail 50 per cent. or more heavier *must* be used for equal safety, if not durability.

January Earnings.

January was unfavorable to the railroads in the West by reason of numerous snow blockades, which, however, were not so serious as they have been some winters, and stopped the trains of but few roads for as much as 24 hours at a time. The snow, however, extended much further south than usual, and very far to the southwest, while on the other hand, there was very little serious delay north of Iowa and Nebraska. The great snow storms were accompanied by very severe weather, however, and this lasted much longer than the blockades, and probably caused a very important reduction in the quantity of produce shipped and general business done, especially as prices were not tempting. At least we find roads which were scarcely blockaded at all suffering apparently as much as some that were.

January was not a particularly unfavorable month last year, 77 railroads then reporting having a slight increase over 1884. We shall be able to judge better of the earnings this year by comparing them with those in January in several previous years.

So far we have reports of earnings from 29 railroads, and their aggregate earnings in January this year and last were :

	1886.	1885.	Decrease.	P. c.
Earnings	$9,715,820	$10,360,304	$644,484	6.2

The decrease is large, and it is quite general, 19 of the 29 having some decrease; but there are a few large gains, as 19¼ by the Buffalo, Rochester & Pittsburgh, 17 by the Canadian Pacific, and 65 by the Gulf, Colorado & Santa Fe. The larger losses are 14 per cent. by the Chicago & Alton, 11¼ by the Chicago & Northwestern, 13½ by the Illinois and Southern lines and 15 by the Iowa lines of the Illinois Central, 10½ by the St. Louis & San Francisco, 9½ by the Louisville & Nashville, 15 by the Mobile & Ohio, 13 by the Norfolk & Western, 13 by the Northern Pacific, and 20½ by the St. Paul & Duluth—most of which were not affected at all by the snow.

But we shall see better the actual importance of the earnings last month by the following table, which gives the total and the earnings per mile for five successive years of those roads which have reported so long :

	1882.	1883	1884.	1885.	1886.
Can. Pac.	.....	$189,000	$261,000	$423,764	$497,000
Per mile	.....	104	135	152	178
Nor. Pacific	$245,369	358,985	614,103	553,582	480,749
Per mile	252	253	251	227	180
St. P., M. & M.	395,078	493,148	452,570	462,125	409,176
Per mile	420	392	339	334	278
St. P. & D.	65,562	71,461	71,494	81,381	64,847
Per mile	335	340	315	358	286
C., M. & St. P.	1,434,537	1,359,199	1,467,097	1,517,398	1,445,000
Per mile	350	301	308	316	292
C. & N. W	1,644,936	1,357,622	1,502,418	1,512,680	1,335,200
Per mile	527	379	395	402	347
C., S.P., M. & O.	327,478	308,465	350,283	331,452	326,600
Per mile	326	267	273	250	247
Cen. Iowa	93,031	82,593	77,309	85,646	80,429
Per mile	381	253	253	171	161
Ill. Cent. in Ia.	158,483	121,942	131,512	103,603	88,350
Per mile	394	303	327	258	235
M., L. S. & W.	66,371	61,928	73,214	72,605	94,615
Per mile	237	214	214	149	177
Chic. & Alton	585,830	646,386	666,642	646,834	557,241
Per mile	689	760	784	760	656
St. L. & S. F.	254,040	280,990	313,759	315,933	282,400
Per mile	359	384	427	387	346
Den & R. G.	516,128	463,762	399,886	405,341	404 424
Per mile	460	353	304	308	307
Ill. Cen. (in Ill. & S. Div)	860,969	979,717	826,572	915,957	765,700
Per mile	568	654	540	550	460
C. I. St. L. & C.	218,599	191,782	170,318	203,444	184,529
Per mile	639	561	496	595	545
C. & E. Ill.	145,464	138,864	125,425	127,034	132,336
Per mile	594	551	497	504	525
C. & W. Mich.	106,128	97,876	107,722	74,928	84,505
Per mile	289	251	261	181	205
Det., L. & Nor.	112,839	107,432	85,854	78,949	65,770
Per mile	499	475	373	302	252
Flint. & P. M.	167,548	190,179	186,792	144,350	152,071
Per mile	481	549	515	399	420
Ind., B. & W.	201,883	248,142	198,685	169,771	178,762
Per mile	356	363	290	319	336
Louis. & Nash.	964,527	1,118,735	1,039,317	1,170,749	1,056,910
Per mile	476	552	503	567	525
Mobile & O.	159,676	216,212	179,228	201,681	171,051
Per mile	302	428	339	382	328
Norf. & W	168,572	200,487	213,020	230,464	200,857
Per mile	394	468	424	459	399
Gulf, C. & S. F.	101,125	173,034	138,414	92,297	152,000
Per mile	271	359	258	172	258
Long Island	121,593	129,993	135,612	150,436	153,033
Per mile	363	367	383	425	432

In the above table, the roads are arranged geographically, beginning with the extreme northwest, which will enable us to compare each road with its neighbors. It will be found that many roads not only earned less than last year, but less than in several previous years. Those of the Manitoba, the Northwestern, both divisions of the Illinois Central, and the Detroit, Lansing & Northern, were the smallest for five years, and the earnings *per mile* of no less than 12 of the 29 roads were smaller last January than in any other of the five, while four more had smaller ones only in 1885. On the other hand, only two roads, the Canadian Pacific and the Long Island, had larger earnings per mile this year than ever before.

Nearly all the reports so far are from Western and Southern roads. We shall not expect the comparison with last year to be so unfavorable for the lines further east and north.

The general southern change of gauge from 5 ft. to the northern standard, which has been in contemplation for some time past, was fully arranged at a meeting held in Atlanta, Ga., last week, at which all the important lines south of the Ohio and east of the Mississippi were represented, with the exception of the Mobile & Ohio and the Illinois Central, which have already made the change. The meeting was one of conference, not to consider the question of changing, for that has been already decided, but to arrange the time and manner of making the change, in order that it may interfere as little as possible with through traffic. After consideration in committee and discussion in the convention it was agreed that May 31 and June 1 next shall be the days for the general change, about half the main lines to be altered on each day.

The general programme having been laid down, there was a discussion on the details of the work to be done, which, doubtless, proved of much benefit to those present, who will have the active management of the work; nearly all the companies having been represented by their chief engineers, roadmasters and master mechanics, as well as by their general managers.

An important step taken was the selection of the Pennsylvania standard of 4 ft. 9 in. as the future standard gauge of all the lines, instead of the 4 ft. 8½ in., which is popularly called the standard gauge, but which will be exceptional in the part of the country south of the Pennsylvania system. The convention also appointed a committee to settle upon a standard wheel gauge, so as to secure, if possible, the setting of wheels with uniform clearance, play etc., thus taking up a work which the Master Car-Builders' Association has made several attempts to complete. This committee is to report at an adjourned meeting to be held next week, when the remaining details will be settled.

The date fixed for changing gauge applies to the main lines of the several roads, and it will doubtless take a few weeks to finish the work on all the branches and lateral lines. The main point is, however, settled, and by mid-summer the 5 ft. gauge will practically have disappeared, following the 5 ft. 6 in. and the 6 ft. gauges, now almost forgotten.

A meeting of the western connections of the trunk lines forming the Central Traffic Association was held in Chicago last week, at which Mr. Blanchard, already selected by the Chicago railroads as their Commissioner, was authorized to make arrangements for organizing pools at the several Western points, and otherwise secure the coöperation needed to maintain rates. It is reported that Mr. Blanchard was authorized to represent the Chicago & Atlantic at this meeting, and this is probably true, but he was probably not authorized to bind it to any course of action, and it is certainly true that that company has not become a party to any agreement as yet, and that its coöperation is needed. It has been maintaining rates, apparently; but what is needed is assurance that it will continue to do so. The considerable proportion of the Chicago grain shipments which it has taken recently is said not to have gone to the Erie, but chiefly to the Baltimore & Ohio, while the Erie is getting most of its Chicago freight from the Chicago, St. Louis & Pittsburgh. Under the trunk-line agreement, the Baltimore & Ohio will insist that the Chicago & Atlantic shall maintain rates, and should the latter at any time decide not to maintain them, it will be able, apparently, to find no other outlet to the East than the Chesapeake & Ohio. This is not a long route to the sea from Cincinnati, Louisville and St. Louis, but from Chicago to Newport News is 1,060 miles, and there is not much temptation to take freight for that distance at a cut from the Baltimore rate. Moreover, only an inconsiderable fraction of the grain shipped from Chicago is now exported, and fully half of it goes to interior points in the East. To take grain 1,060 miles by rail to Newport News and then several hundred miles north to the seaboard cities will cost, it may safely be said, more than can be got for it when the Chicago-New York rate is not more than 25 cents. That it will not pay, however, does not make it certain that it will not be done. So far the Chesapeake & Ohio has secured very little freight except from Cincinnati, Louisville and St. Louis, and usually not much from them. If grain exports were large, it might get a large proportion of the shipments from those places probably; but the exports are so small that the regular steamer lines are not able to get enough to fill out their cargoes, and therefore take it at rates so low that no sailing vessel or "tramp" steamer can afford to compete with them, and this makes it more than usually difficult to secure exports for a port which has no regular lines.

It is strange to see how many generally well informed people speak of the recent diversions of St. Louis shipments to the Chesapeake & Ohio as accounting for the small Chicago shipments. In the first place the Chesapeake & Ohio did not take a large proportion even of the St. Louis shipments until the last week of January, while the Chicago shipments were very light all the month, and smaller before than they have been since and second, the total St. Louis shipments are so small in proportion to the Chicago shipments that the doubling of them entirely at the expense of Chicago would not account for nearly the whole decrease at Chicago. The latter is sufficiently accounted for by the extraordinarily small shipments of grain and flour to the seaboard. The receipts of grain and flour at the Atlantic ports for the six weeks ending Jan. 30 were equivalent to 19,880,958 bushels this year, against 24,805,527 last year. The total *shipments* from all the Northwestern markets in this time fell from 21,237,940 to 15,638,973 bushels.

It is true that the decrease in shipments at Chicago has been larger in proportion than at most other places, but this is because the chief decrease has been in wheat and flour, which at this season go chiefly from Chicago, and but little from places further south, which have already marketed their wheat at this time. Of the whole decrease of 5,599,000 bushels of flour and grain shipments in the six weeks above, 4,905,421 bushels were wheat and flour, and by far the larger part of this must have been shipped from or through Chicago last year. Meanwhile corn shipments are likely to be as large from St. Louis, etc., at this season as at almost any time, but at Chicago to be held back more for the opening of navigation.

The later down we come, the greater is the difference between this year's and last year's grain shipments. In the last week of January, when first the Chesapeake & Ohio took a large part of the St. Louis shipments, the total Northwestern shipments of grain (not including flour) were 1,915,698 bushels this year, against 5,625,383 last year. With such an enormous decrease shipments have necessarily fallen off, not at Chicago only, but elsewhere. The importance of the Chesapeake & Ohio shipments is due, not to diverting a large traffic from other Western points to St. Louis, but to making it almost certain that all through east-bound rates would be reduced if it continued.

A railroad war on a small scale, but with much of the bitterness which characterizes more important affairs, seems to be about breaking out in Massachusetts between the Boston & Lowell and Boston & Maine corporations. A hostile feeling between the two has existed for a long time, showing itself first when the Boston & Maine encouraged the building of the Lowell & Andover Railroad, and afterward leased it, thus forming a competing line between Boston and Lowell. The latter road then secured an entrance into Lawrence, invading the territory of the Boston & Maine. Next the Boston & Maine leased the Worcester, Nashua & Rochester road, which was an invasion of the Boston & Lowell's country. Recently the Boston & Lowell, which owns a line between Salem & Lowell, formed a plan to build a spur track in Salem to reach certain tanneries, which now appear to be the chief industry and most important business of the old town once famous for its extensive East India trade. But before this purpose was announced, the Boston & Maine, as lessee of the Eastern road, determined to reach these tanneries by a spur from that road, and having entered upon that project finally proposed a loop line which while reaching the tanneries gives it a route through Salem, avoiding the tunnel. The question of exigency for either or both these branches is now before the Railroad Commission, and the mutterings of the rivals indicate that whatever the decision of the commissioners there will be further and perhaps more serious hostilities. The Boston & Lowell proposes to have a new and shorter line between Boston and Salem. If that is attempted there are several vulnerable points on the Boston & Lowell main line which the Boston & Maine can easily reach. Fortunately the necessity for these proposed branches must be determined by the Railroad Commission, so that the hostile parties may be restrained and prevented from doing each other all the mischief they wish. But the managers seem to be ready to continue hostilities indefinitely.

The New York Central report for the last quarter of 1885 shows that the profits over fixed charges then were $1.43 per share, against $1.54 in 1884 The im-

provement over previous quarters in 1885, however, is very great, the profit per share having been but 10 cents in the quarter to Sept. 30, and for the three quarters then ending, 89 cents; thus for the calendar year 1885 the profit was $2.32, five-eighths of which was made in the last quarter, which is, however, usually the best of the year.

The December report of the New York, Lake Erie & Western Railroad shows a very large increase in gross earnings in 1885 compared with 1884, and some increase over 1883, when, however, they were less than in any previous year since 1879. The working expenses were decidedly larger than in 1884, but much less than in 1883; and the net earnings, together with the profit or loss on the leased New York, Pennsylvania & Ohio road, have been:

Year.		Year.	
1877	$461,259	1882	$441,739
1878	305,726	1883	226,342
1879	349,768	1884	350,343
1880	497,183	1885	515,360
1881	381,382		

This is certainly a remarkable change. The income available for paying interest, etc., was larger last December than in any other, 47 per cent. more than in 1884, and 128 per cent. more than in 1883.

For the first three months of the fiscal year the net earnings, after deducting rental of the leased Ohio road, have been:

Year.		Year.	
1877	$1,674,166	1882	$1,842,273
1878	1,443,294	1883	1,772,788
1879	1,623,687	1884	1,468,010
1880	2,129,291	1885	1,799,744
1881	1,646,644		

Thus the profits for the quarter in 1885 were exceeded only in 1880 and 1882, and were $231,734, or 22½ per cent., more than in 1884—certainly a very great improvement.

From present appearances it is not at all certain that the convention of the Master Mechanics' Association will be held at the regular time in June next. There is, we understand, considerable discussion on the subject of changing the time of the annual meeting for this year, the chief reason being the proposed general change of gauge of Southern railroads which is to be made in June. This change will throw a large amount of extra work upon the master mechanics of the Southern roads, and will effectually prevent the attendance of any of them at the convention should it be held at the usual time. No definite action has been taken toward changing the time, although the third Tuesday in September has been spoken of as likely to be the date selected, as by that time the pressure of work will be over and there will be no obstacle to a full attendance of members. The reason given seems to be a very good one, and September would probably be a much better time for the convention this year than June.

Chicago through rail shipments eastward increased largely last week, though they remained small for the season. For the week ending Feb 6 and the corresponding weeks of previous years they have been as follows, including only flour, grain and provisions this year and last and freights of all classes in previous years:

1880.	1881.	1882.	1883.	1884.	1885.	1886.
38,492	53,209	73,425	43,388	41,834	81 975	39,170

Thus the shipments were not quite half as large as last year, but allowing for the higher class freights, which were probably more than 12,000 tons, they were probably larger than in any other year except 1882 and 1881 and nearly as large as in 1881.

For six successive weeks the total shipments and the per centage taken by each railroad have been:

	Week ending.						
	Dec.	Jan.	Jan.	Jan.	Jan.	Jan.	Feb.
Tons:	26.	2.	9.	16.	23.	30.	6.
Flour	7,024	4,495	3,206	3,804	4,416	3,551	5,564
Grain	18,834	19,440	17,056	10,713	12,736	12,344	17,868
Provisions	11,715	10,278	8,913	8,965	8,800	9,351	9,738
Total	37,573	34,213	29,175	23,482	25,952	25,246	33,170
Per cent.:							
C. & Grand T.	10.6	11.8	7.7	7.2	7.5	9.0	8.5
Mich. Cen	13.5	11.0	13.4	12.0	12.0	12.0	12.1
Lake Shore	20.3	14.7	16.5	14.7	16.3	13.5	13.2
Nickel Plate	10.0	10.4	8.7	6.4	8.3	7.5	11.1
Ft. Wayne	16.0	16.4	16.2	23.7	18.1	21.6	18.9
C., St. L. & P.	13.2	13.8	11.8	16.4	12.4	16.1	13.2
Balt. & Ohio	7.0	8.9	13.5	12.0	14.9	11.1	11.3
Ch. & Atlantic	9.4	13.0	12.2	7.6	10.5	9.2	11.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100 0

Compared with the previous week there was an increase last week of 56¾ per cent. in flour and of 45 per cent. in grain, also of 4 per cent. in provisions. The grain and flour shipments were the largest for six weeks, yet were not large, as may be seen by comparing them with the shipments in the corresponding six weeks of last year:

	Week ending.					
Tons.	Jan. 3.	Jan. 10.	Jan. 17.	Jan. 24.	Jan. 31.	Feb. 7.
Flour	9,394	11,836	10,905	7,247	14,014	19,219
Grain	19,362	29,772	42,977	32,995	50,340	52,131
Provisions	16,648	13,005	13,171	10,088	10,483	10,025
Total	39,404	54,611	67,053	50,330	75,737	81,375

It appears from this that the provision shipments were not much larger this year than last, amounting then to 67,418 tons for the six weeks, against 56,045 this; but the flour shipments have decreased greatly, from 73,515 tons to 25,036, and the grain shipments still more, from 227,577 to 90,157.

The percentages are not particularly remarkable, the larger changes from the previous week being the gain of 3.6 per cent. by the Nickel Plate, the loss of 2.7 and 2.9 respectively, by the two Pennsylvania roads, and the gain of 2.5 by the Chicago & Atlantic. The latter again led in amount of grain taken, which amounted to 20½ per cent. of the whole, the Michigan Central coming next with 14½ per cent. In provisions, the Fort Wayne led, with 24.8 per cent., while the Chicago, St. Louis & Pittsburgh took 18.7, the Lake Shore 16.6, and the Nickel Plate 11.5 per cent., leaving but 28.4 per cent. for the other four roads. The Chicago & Grand Trunk usually has a much larger share of the provisions, but it has had an unusually small share of the total shipments for several weeks past, and so, for that matter, has the Michigan Central. The distribution, however, varies a good deal at different seasons, and when the shipments are very small, and made so largely by the interruption of exports, considerable changes are to be expected; for some roads depend much more than others on export freight, and when the shipments are chiefly for domestic consumption these lines suffer most.

The annual report of the Master Mechanics' Association is now ready, and copies will be sent to all members of the Association at once, with the usual number of copies to the yearly subscribers to the printing fund.

Secretary Setchel is desirous of securing copies of the fourth annual report, for the year 1871, and wishes to say that he will pay $1.50 for each copy of that report sent to him in good condition He has on hand a sufficient stock of all others of the series of reports and copies can be obtained from him on application.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines is given in the current number of the *Railroad Gazette* as follows:

Fairmont, Morgantown, & Pittsburgh.—Extended northward to Morgantown, W. Va., 6 miles.

Wichita & Colorado.—Completed from Wichita, Kan., west to Andale, 23 miles.

This is a total of 29 miles on 2 lines, making in all 91 miles thus far reported for the current year. The new track reported to the corresponding date for 15 years has been:

	Miles.		Miles.		Miles.
1886	91	1881	173	1876	73
1885	68	1880	220	1875	62
1884	147	1879	70	1874	66
1883	163	1878	136	1873	226
1882	313	1877	62	1872	151

These figures include *main track only*, second tracks and sidings not being counted.

NEW PUBLICATIONS.

Ealy's "Blue Book" of Special Credits, containing the names, with ratings, of all manufacturers and dealers in Hardware, Iron, Machinery, Agricultural Implements, Railway, Machinists' Engine and Boiler Makers' Supplies * * * and workers in iron, metals and kindred branches of trades generally in the United States and Canada." January, 1886. John W. Ealy Co., New York and Chicago.

This volume is similar in size of page and in general arrangement to Bradstreet's or Dun's reports, but, being limited to the trades indicated in its title, it is less cumbersome, and at the same time it is enabled to give more precise information as to the worthiness of the firms reported on than is given in the more general volumes which include all trades. The street addresses of firms in the larger cities are given, and, in addition to the estimated amount of money invested in the business, there is stated in plain words the exact information which in other reference books is left for inference. For instance: "Usually discounts bills," "prompt pay," "medium pay," "pays notes, but slow on accounts," "account — months past due," "will not answer letters," "habitually disputes terms," etc. Indeed, the "key" to the ratings in the book is rather interesting reading, as showing what a variety of abnormal tendencies the human mind is capable of. It is evidently the purpose of the publishers of this book to define as clearly as possible the *paying qualities* of each member of the trades, in addition to their legal responsibility as expressed by their capital. It is a good book, and having constantly used the previous volumes for several years we have found the information in nearly all cases reliable.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chicago, St. Louis & Pittsburgh, annual meeting, in the Union depot in Indianapolis, Ind., March 17.

Delaware, Lackawanna & Western, annual meeting, at the office in New York, Feb. 23.

Housatonic, annual meeting, at the office in Bridgeport, Conn., Feb. 26.

Illinois Central, annual meeting, at the office in Chicago, March 10.

Missouri Pacific, annual meeting, at the office in St. Louis, at 9 a. m., on March 9. Transfer books close Feb. 6.

New Orleans & Northeastern, annual meeting, at the office in New Orleans, March 1.

Peoria, Decatur & Evansville, annual meeting, in Peoria, Ill., March 2.

St. Louis & Cairo, special meeting, to vote on the question of leasing the road to the Mobile & Ohio, in New York, March 15.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Cleveland & Pittsburgh (leased to Pennsylvania Co.), 1¾ per cent., quarterly, payable March 1, to stockholders of record on Feb. 10.

Kansas City, Ft. Scott & Gulf, 4 per cent., semi-annual, on the preferred stock, and 2½ per cent. on the common stock, both payable Feb. 15, to stockholders of record on Feb. 10.

North Pennsylvania (leased to Philadelphia & Reading), 2 per cent., quarterly, payable Feb. 25, to stockholders of record on Feb. 10.

Railroad and Technical Conventions.

Meeting and conventions of railroad associations and technical societies will be held as follows:

The *American Institute of Mining Engineers* will hold its next meeting in Pittsburgh, beginning on Tuesday, Feb. 16.

The *National Association of General Passenger & Ticket Agents* will meet in Chicago, on Tuesday, March 16.

The *Southern Time Convention* will hold its spring meeting at the Grand Hotel in Cincinnati, on Wednesday, April 14.

The *General Time Convention* will hold its spring meeting at the Grand Hotel in Cincinnati, on Wednesday, April 14.

The *Master Car-Builders' Club* will hold its regular monthly meetings through the winter at the rooms, No. 113 Liberty street, New York, on the evening of the third Thursday in each month.

The *New England Railroad Club* will hold its monthly meetings at its rooms in the Boston & Albany passenger station in Boston, on the evening of the second Wednesday in each month.

The *Western Railway Club* will hold its regular monthly meetings at its rooms, No. 103 Adams street in Chicago, on the third Wednesday in each month.

Foreclosure Sales.

The *Danville, Olney & Ohio River* road was sold in Springfield, Ill., Feb. 10, under a decree of foreclosure granted by the United States Circuit Court, and bought for $175,000 by Mr. C. W. Fairbanks, as Counsel for the bondholders' committee. The road extends from Danville, Ill., south to Olney, 109 miles.

Master Car-Builders' Club.

A business and social meeting of the Master Car-Builders' Club will be held at the rooms, No. 113 Liberty street, New York, Thursday, Feb. 18, at 8 p. m.

Subject for discussion: Car paints and car painting, and repairs of cars by contract.

Master painters and foremen of paint-shops are especially invited to be present.

American Society of Mechanical Engineers.

A circular from Secretary F. R. Hutton says: "The members are hereby informed also of the invitation which it has been decided to accept, that the next meeting of the Society (13th) in the spring, be held in the city of Cnicago. The date fixed for the first session is Tuesday, May 25, 1886. Details of the convention will be given in a subsequent circular. It is hoped that the place selected for the meeting will bring out a full attendance, and every effort will be made by the hosts to insure a successful and interesting meeting. A number of valuable papers is already promised.

"Under the action of recent rules of the Council, papers for this meeting must be in the Secretary's hands before March 22. This requirement is made in order that time may be given for those members who intend to discuss a paper to receive an advance copy beforehand for the preparation of their remarks. It has also been made necessary that provision be made for shortening the time consumed in presenting papers, to allow time for the discussions with their increasing interest and length. The Secretary would like the *titles* of all papers at once."

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—The following order from Second Vice-President and Chief Engineer A. A. Robinson is dated Topeka, Kan., Feb. 1: "Mr. Lewis Kingman is appointed to the position of Assistant Engineer of the Construction Department, with headquarters at Topeka, Kan. His orders will be observed accordingly from this date."

Brockville, Westport & Sault Ste. Marie.—Mr. W. B. Smellie has been appointed Chief Engineer of this company, with office at Brockville, Ont. Mr. Smellie was formerly Assistant to the Chief Engineer for the construction of the Canadian Pacific Railway by the Canadian Government, and afterward Consulting Engineer to the Canadian Pacific Railway Company.

Central Vermont.—Mr. James R. Langdon has been elected First Vice-President. He will act as Chairman of the Finance Committee, and will have general supervision over the finances of the company. Mr. Edward C. Smith has been chosen Second Vice-President. He has been for some time past acting as Assistant to the President.

Mr. Herbert Brainerd is appointed General Baggage Agent, with office at St. Albans, Vt., in place of C. B. Swift, deceased.

Cleveland, Columbus, Cincinnati & Indianapolis and *Indianapolis & St. Louis.*—The following circular from General Manager G. M. Beach is dated Cleveland, O., Jan. 27: "Mr. H. K. Devereux has this day been appointed Registrar of these companies, and will have charge of all deeds and muniments of title pertaining to right-of-way, assessment of taxes, contracts and leases. He will meet with the various boards of assessments, and prepare all state and county blanks for such boards. This appointment to take effect Monday, Feb. 1."

Columbus & Western.—At the annual meeting in Opelika, Ala., Jan. 20, the following directors were chosen: W. G. Raoul, W. L. Clark, H. H. Epping, E. A. Flewellen, G. P. Harrison, Jr., B. T. Hatcher, T. B. Gresham, George J. Willis. The board elected W. Raoul President; E. A. Flewellen, General Manager; Andrew Anderson, Secretary; Edward McIntyre, Treasurer.

Dayton & Union.—The directors have re-elected officers as follows: C. C. Waite, President; G. M. Beach, Vice-President and General Manager; Geo. H. Russell, Secretary and Treasurer; P. A. Hewett, Auditor.

East Tennessee, Virginia & Georgia.—Mr. E. H. Barnes is appointed Superintendent of the Georgia Division, vice Mr. J. W. Fry, resigned to accept a position on the Mobile & Ohio Railroad. Appointment taking effect Feb. 8.

Florida Southern.—Mr. W. W. Mitchell is appointed Cashier and Paymaster, with office at Palatka, Fla. Mr. J. C. Tilfer is relieved from duty as Cashier, but continues Auditor of the company.

Fitchburg.—Mr. E. A. Smith has been appointed Chief Train Dispatcher, with office in Boston. He has been for a number of years Train Dispatcher of the Vermont & Massachusetts Division. Mr. A. L. Whipple is appointed Assistant Dispatcher, with office in Boston.

Indianapolis Belt.—At the annual meeting in Indianapolis, Feb. 2, the following directors were chosen: M. A. Downing, W. P. Ijams, A. D. Lynch, W. R. McKeen, R. S. McKeen, John F. Miller, D. W. Minshall, Horace Scott, John Thomas. The board re-elected W. R. McKeen President; Horace Scott

Vice-President; A. D. Lynch, Secretary and Treasurer; W. P. Ijams, Manager.

Little Miami.—At the annual meeting in Columbus, Jan. 26, the following directors were chosen: Wm. Worthington, Joseph H. Rogers, Frank J. Jones, John Mitchell, L. B. Harrison, Louis Ballauf, A. D. Bullock, Henry Hanna, Julius Dexter, Cincinnati; Thomas D. Messler, Pittsburgh, Pa.; W. H. Clement, Morrow, O.; A. S. Frazer, Xenia, O. The old officers were re-elected as follows: Henry Hanna, President; Julius Dexter, Vice-President and Secretary; S. E. Wright, Treasurer. The road is leased to the Pittsburgh, Cincinnati & St. Louis.

Lowell & Framingham.—This company, whose road is operated by the Old Colony Co., has elected directors as follows: Samuel N. Aldrich, Frederick L. Ames, Hiram A. Blood, Charles F. Choate, Wm. J. Rotch, Nathaniel Thayer, Royal W. Turner.

Napanee, Tamworth & Quebec.—At the annual meeting recently the following directors were elected: H. B. Rathbun, E. W. Benjamin, F. S. Rathbun, W. F. Hall, Hurbert B. Rathbun, A. Henry, R. C. Carter, W. S. Williams, W. R. Aylesworth.

Massillon & Cleveland.—At the annual meeting in Massillon, O., Feb. 2, the following directors were elected: Louis H. Meyer, Charles W. Cass, New York; J. N. McCullough, John J. Haley, Pittsburgh, Pa.; John Sherman, Mansfield, O.; P. G. Albright, Massillon, O.; J. F. Card, Cleveland, Ohio. The board elected Louis H. Meyer President; John J. Haley, Secretary and Treasurer.

Montana Central.—This company has elected officers as follows: President, Charles A. Broadwater; Vice-President, Benjamin F. Potts; Secretary and Treasurer, Wm. Harrison; Chief Engineer, J. T. Dodge. Office in Helena, Montana.

Newport, Cape Foulweather & King's Valley.—The directors of this new company are: J. R. Bailey, Royal F. Baker, J. W. Brasfield, G. R. Megginson. Office at Newport, Oregon.

Newport News & Mississippi Valley Co.—The following circular from Controller Wm. Mahl is dated New York, Feb. 1: "Mr. C. H. Bronson has been appointed Auditor of the Eastern Division of this Company, operating the Elizabethtown, Lexington & Big Sandy Railroad Ticket, Freight and mileage accounts and other communications should be addressed to him at Richmond, Va. Mr. J. W. Baird has been appointed Auditor of the Western Division of this Company, operating the Chesapeake, Ohio & Southwestern Railroad. Ticket, freight and mileage accounts and other communications should be addressed to him at Louisville, Ky."

The following circular from Third Vice-President John Echols is dated Louisville, Ky., Feb. 1: "The Chesepeake, Ohio & Southwestern Railroad will hereafter be operated as a part of the Western Division of this company; and under the authority vested in me by the President of the company, the following appointments are made for the conduct of its business: Jas. L. Frazier, Superintendent; B. F. Mitchell, General Freight and Passenger Agent; Holmes Cummins, Chief Attorney; A. T. Sabin, Superintendent of Road Department; R. H. Briggs, Superintendent of Motive Power; S. Young, Cashier; E. P. Rowell, Paymaster; C. F. Krebs, Assistant to Third Vice-President. The Superintendent of Roadway and Superintendent of Motive Power will report to the Superintendent at Louisville. The other officers will report to the undersigned. The regulations for conducting the business of the Chesapeake, Ohio & Southwestern Railroad Co. heretofore in force, will be observed strictly in conducting the business of this company."

New York District.—The officers of this company, whose proposed underground railroad in New York city has been heretofore described, are: President, Charles Spear; Secretary Oliver K. King; Treasurer, J. Coleman Drayton; Chief Engineer and Architect, George B. Post. Office at No. 146 Broadway, New York.

The company has appointed a board of consulting engineers, as follows: Foundation, Masonry and Ventilation, Wm. P. Trowbridge, Charles C. Martin; Hydraulics and Sewers, Julius W. Adams, John T. Fanning; Metallic Structures, Alfred P. Boller, Charles C. Schneider; Concrete and Cement, Gen. Quincy A. Gillmore; Electrical Equipment; Prof. Henry Morton; Sanitation, Dr. Charles F. Chandler.

Rapid City & Southwestern.—The directors of this new company are: Hepburn F. Coad, F. F. Evans, S. G. Evans, A. J. Simmons. Office at Rapid City, Dakota.

St. Louis, Arkansas & Texas.—This company, successor to the Texas & St. Louis in Texas, has elected directors as follows: Wm. Behan, George Clark, L. B. Fish, James Garrity, Matthias Grossarth, Adolph Oppenheimer, C. M. Seley. The board elected Adolph Oppenheimer President; Matthias Grossarth, Secretary.

St. Louis & Chicago.—At the annual meeting in Litchfield, Ill., Feb. 3, the following directors were chosen: R. S. Hodgeson, J. R. Lackridge, Litchfield, Ill.; D. L. Wing, Charleston, Ill.; Lewis H. Thomas, Bois d'Arc, Ill.; C. J. Kaiser, Mt. Olive, Ill. The board elected D. L. Wing President; R. S. Hodgeson, Secretary and Treasurer; A. J. Kleinbach, Chief Engineer.

Schuylkill Navigation Co.—At the annual meeting in Philadelphia, Feb. 10, the following were elected: President, Frederick Fraley; directors, George Brooke, John N. Hutchinson, John B. Love, Thomas R. Patton, Charles W. Wharton, Passmore Williamson; Secretary and Treasurer, Richard Wilkins.

Western Association of General Passenger & Ticket Agents.—At the annual meeting in Louisville, Ky., Feb. 10, the following officers were chosen: President, J. S. Clark; Vice-President, B. F. Horner; Secretary, J. M. Chesbrough; Executive Committee, J. Charlton, Wm. Hill, F. Chandler, W. H. King and J. R. Buchanan.

West Shore.—The following order from General Manager J. D. Layng is dated New York, Feb. 1:

"Mr. F. A. Haskell is appointed General Agent of this railroad at New York city, to take effect this date. His address will be Eleventh avenue and 32d street, New York. The General Agent will have the supervision of all the freight agencies of this railroad at its New York terminus, including Weehawken. All matters relating to rates, billing, etc., will be under the direction of the General Freight Agent as heretofore."

Wilmington, Chadbourne & Conwayboro.—Mr. Wm. H. Chadbourne, of Wilmington, N. C., is President of this company.

Woodruff Sleeping & Parlor Coach Co.—Mr. George McGowan has been appointed Assistant Superintendent, with headquarters in Chicago. Mr. Richard J. Vreeland has been appointed Cashier of the New York Division, with headquarters at No. 115 Broadway, New York, vice George McGowan promoted.

PERSONAL.

—Mr. R. V. Dohoney, recently Master Mechanic of the Florida Railway & Navigation Co., has started for South America, where he will be occupied in railroad construction. Mr. Dohoney goes out as representative of New York capitalists.

—Mr. John G. Thompson, of Columbus, O., died suddenly in Seattle, Wash. Ter., Feb. 10, aged 53 years. He was widely known as an active politician, having taken part in nearly all the Ohio campaigns for 25 years past. He served one term as Railroad Commissioner of Ohio, having been appointed by Gov. Allen in 1874.

—Mr. Edward R. Coleman, of Louisville, Ky., died in New York, Feb. 7, while on a visit to that city. He was largely engaged in the iron manufacture in Louisville, in connection with his brothers, and was 37 years old. He was President of the Louisville Southern Railroad Co., organized some time ago to build a road from Louisville southward to compete with the Louisville & Nashville.

—Mr. John Gerrish Webster died in Boston, Feb. 7, aged 74 years. He was born in Portsmouth, N. H., but came to Boston 45 years ago, and with his brother established the firm of Webster & Co., for many years prominent manufacturers and dealers in leather. He was one of the incorporators of the Boston, Revere Beach & Lynn Co., and was a director and Treasurer of the company from its first organization until 1881.

—Mr. Abraham Groesbeck, one of the earliest settlers and for many years a prominent citizen of Houston, Tex., died in that city Feb. 6, aged 71 years. He was formerly one of the largest landholders and wealthiest men in the state, but afterward lost a large part of his fortune. He was one of the projectors of the Houston & Texas Central Railroad, and took an active part in its construction, serving as a director and Vice-President of the company for a number of years.

—Mr. Henry Dart, a well-known civil engineer and contractor, died in New Orleans, Feb. 4, aged 78 years. He was born in England, but settled in New Orleans 50 years ago. He built a part of the New Orleans, Jackson & Great Northern road, and was for some years employed on contracts for forts and other works for the United States government. For a number of years after the war he was employed in building bridges and other railroad works, and had also several city contracts.

—Mr. Francis Minot Weld died at his residence in Jamaica Plain, Mass., Feb. 4. He was born in Lancaster, Mass., 72 years ago, was educated in Boston graduated from Harvard College. Soon afterwards he went to New Orleans, where he founded the house of F. M. Weld & Co., cotton merchants, having as a partner Mr. Charles H. Minot. The firm closed up its affairs prior to 1860 and came to Boston, where the same gentlemen engaged in the East India trade under the firm name of Weld & Minot. Some 25 years ago the firm was dissolved, Mr. Minot going into the ice business with the Tudors, and Mr. Weld assuming the treasurership of the China, Webster and Pembroke print mills, of Suncook, N. H., a position he held at the time of his decease. Mr. Weld was a director in the Boston & Providence Co., and also in the Kansas City, Fort Scott & Gulf Co., in which he was a large stockholder. He was the last of five brothers, all prominent and successful men.

TRAFFIC AND EARNINGS.

Coal.

Anthracite coal tonnages for the month ending Jan. 30, as given by the weekly reports of the companies, have been as follows for eight years past:

	Tons.		Tons.
1886	2,317,514	1882	2,100,480
1885	1,576,010	1881	1,819,921
1884	1,920,734	1880	1,981,541
1883	2,115,563	1879	1,820,099

The tonnage this year shows an increase of 741,504 tons, or 47 per cent., over last year. The year opens certainly with no signs of a restricted production or small output. The coal is said to be finding ready sale, but at very low prices.

Bituminous coal tonnages for the month ending Jan. 30 are reported as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Cumberland, all lines	158,013	149,505	I. 8,508	5.7
Huntingdon & Broad Top	20,082	12,571	I. 7,511	59.6
Barclay R. R. & Coal Co.	13,181	21,499	D. 8,318	39.5
Beech Creek, Clear. & S. W.	75,346	48,152	I. 27,194	56.5
Pennsylvania R. R:				
Clearfield	208,863	258,621	D. 49,758	19.2
Mountain District	42,418	42,734	D. 316	0.7
Penn and Westmoreld	100.331	103,347	D. 3,016	2.9
Other districts	81,188	91,764	D. 10,576	11.5
Norfolk & Western	67,626	31,311	I. 36,315	116.1
Total bituminous	767,048	759,504	I. 7,544	1.0

The increases are chiefly on the new lines, part of whose business is taken from the older ones.

Coke tonnages for the month ending Jan. 31 are reported as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Southwest Penna. R. R.	152,179	147,864	I. 4,315	3.0
Other districts, Pa. R. R.	63,157	48,570	I. 14,587	29.8
Connellsville, *via* Pa. R. R.	3,162	10,019	D. 6,857	67.9
Total coke	218,498	206,453	I. 12,045	5.8

All these tonnages are over the Pennsylvania Railroad. The other coke carriers make no reports.

Shipments of Flat Top coal over the Norfolk & Western road in January were 67,626 tons, an increase of 36,315 tons, or 116.1 per cent., over last year.

Actual tonnage passing over the Pennsylvania & New York road for the two months of its fiscal year from Dec. 1 to Jan. 30 was:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Anthracite	266,127	179,328	I. 86,799	48.2
Bituminous	29,039	40,065	D. 11,026	27.5
Total	295,166	219,393	I. 75,773	34.6

The larger part of the anthracite is received from the Lehigh Valley road, of which this line is an extension.

Shipments of coal on the Monongahela Navigation Co.'s works, from the mines on the Monongahela River above Pittsburgh, for the year ending Dec. 31 were, in bushels:

	1885.	1884.	1883.
Coal	82,459,020	79,769,100	108,487,800
Coke	3,464,057	2,437,752	3,907,589
Total	85,923,077	82,206,852	112,395,389

The increase in coal last year was 2,689,920 bushels, or 3.3 per cent.; in coke, 1,026,305 bushels, or 42.1 per cent.; total, 3,716,225 bushels, or 4.4 per cent. As compared with 1883 the total decrease was 26,472,312 bushels, or 23.5 per cent.

Cumberland coal shipments for the week ending Feb. 6 were 37,962 tons. Total to Feb. 6 this year, 195,975; last year, 182,442; increase, 13,533 tons, or 7.4 per cent.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Month of January:				
Buff., R. & Pitts.	$105,914	$88,484	I. $17,430	19.7
Canadian Pac.	497,000	423,764	I. 73,236	17.3
Central Iowa	80,429	85,646	D. 5,217	6.1
Chi. & East. Ill.	132,336	127,034	I. 5,302	2 6
Chi. & Nor'west.	445,800	514,000	D. 68,200	13.2
Ch., St. P., M. & O.	326,600	331,600	D. 5,000	1.5
Chi. & W. Mich.	84,505	74,928	I. 9,577	12.8
C., L. St. L. & C.	184,529	203,444	D. 18,915	9.3
Col., Hocking Vy. & Tol	170,371	166,838	I. 3,533	2.1
Det., Lan. & No.	65,770	73,949	D. 8,179	11.1
Flint & Pere M.	152,071	144,350	I. 7,721	5.3
Gulf, Col. & S. F.	152,000	92,000	I. 60,000	65.2
Illinois Central	765,500	885,179	D. 119,479	13 5
Iowa lines	88,300	104,245	D. 15,945	15.3
Ind., Bloom & W.	178,763	169,771	I. 8,992	5.3
Long Island	153,033	150,436	I. 2,597	1.7
Louisv. & Nashv.	1,056,847	1,170,749	D. 113,902	9.7
Mexican Cent.	311,936	318,932	D. 7,032	2.1
Mil. & Northern	38,680	39,070	D. 390	1.0
Mobile & Ohio	171,051	201,681	D. 30,630	15.2
N. Y. City & Nor.	37,312	28,828	I. 8,484	29.3
Norfolk & West.	200,857	230,464	D. 29,607	12.9
St. P. & Duluth	64,847	81,386	D. 16,533	20.4
St. P., M. & Man.	409,176	462,125	D. 52,949	11.5
First week in February:				
Chi., Mil. & St. P.	$375,000	$371,924	I. 3,076	0.8
Chi. & East. Ill.	33,573	37,461	D. 3,888	10.4
Mil., L. S. & W.	23,445	17,485	I. 5,960	34.1
St. L. & San F.	52,400	77,300	D. 24,900	32.4
Year ending Dec. 31:	1885.	1884.		
Boston & Albany	$7,758,872	$8,021,821	D. $262,949	3.3
Net earnings	2,369,178	2,402,599	D. 33,421	1.4
C., L., St. L. & C.	2,373,467	2,434,780	D. 61,313	2.5
Net earnings	869,2 8	908,923	D. 39,595	4.4
Den. & R. G. W.	1,921,087			
Net earnings	307,506			
E. Ten., Va. & G.	4,119,147	3,993,622	I. 125,525	3.1
Net earnings	1,413,432	1,482,901	D. 69,469	4 7
Hunt. & Broad Top Mt.	371,001	333,560	I. 37,441	11 2
Net earnings	191,709	175,724	I. 15,985	9.1
Kansas City, Ft. Scott & Gulf	2,546,525	2,422,442	I. 124,083	5.2
Net earnings	989,434	1,014,749	D. 25,315	2.5
L. Rock & Ft. S.	617,416	589,071	I. 28,345	4.8
L. R., M. R. & T.	361,523	368,271	D. 6,748	1.8
Northern Pac.	11,349,699	12,613,105	D. 1,263,406	10.0
Net earnings	5,561,762	6,119,973	D. 558,211	9.1
Union Pacific	25,925,171	25,657,290	I. 267,881	1.0
Net earnings	9,767,450	10,789,175	D. 1,021,724	9.3
Ten months to Oct. 31:				
Central Pacific	$12,208,474	$13,459,206	D. $1,250,732	9.3
Month of October:				
Central Pacific	$1,467,123	$1,519,185	D. $52,062	3.4
Month of December:				
C., L. St. L. & C.	$205,706	$203,093	I. $2,613	1 2
Net earnings	76,590	76,202	I. 388	0.5
Den. & R. G. W.	74,238	98,830	D. 24,592	24 6
Net earnings	17,504	34,492	D. 16,988	49.2
E. Ten., Va. & G.	408,554	376,803	I. 31,751	8.4
Net earnings	195,642	130,430	I. 65,212	50.1
L. Rock & Ft. S.	75,948	76,512	D. 564	0 7
L. R., M. R. & T.	50,022	54,822	D. 4,800	8.4
Northern Pacific	775,371	758,229	I. 17,142	2.3
Net earnings	306,551	340,508	D. 33,957	10.0
Rome, W. & Og.	156,092	138 590	I. 17,502	12.6
Net earnings	51,822	45,627	I. 6,195	13.6
Scioto Valley	56,012			
Union Pacific	2,348,486	2,319,585	I. 28,901	1.2
Net earnings	930,122	1,091,237	D. 161,115	14.8

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Cotton.

Cotton movement for the week ending Feb. 5 is reported as below, in bales:

	1886.	1885.	Inc. or Dec.	P. c.
Interior markets:				
Receipts	55,821	43,663	I. 12,158	27.6
Shipments	63,150	52,745	I. 10,405	19.6
Stock, Feb. 5	469,013	271,790	I. 197,223	72.5
Seaports:				
Receipts	122,418	89,785	I. 32,633	36.3
Exports	103,120	93,658	I. 9,462	10.1
Stock, Feb. 5	1,063,680	869,062	I. 194,618	22.4

The total movement from plantations for the crop year (from Sept. 1) to Feb. 5 is estimated at 5,412,026 bales; an increase of 354,196 over 1884-85, and of 491,239 over 1883-84, and a decrease of 33,208 bales from 1882-83.

The *Commercial and Financial Chronicle* estimates the total amount of cotton which has come into sight (that is, the actual shipments from plantations) for the five months of the crop year to Feb. 1 at 5,320,230 bales, and says: "We have prepared the following table, which shows the movement in each month for the last four seasons, in bales:

	1885-86.	1884-85.	1883-84.	1882-83.
September	485,552	413,836	450,047	402,336
October	1,380,870	1,309 111	1,325,716	1,180,761
November	1,443,433	1,390,902	1,317,773	1,402,052
December	1,488,582	1,360,404	1,264,816	1,435,006
January	541,793	513,187	453,985	803,565
Total, 5 months	5,320,230	4,987,440	4,812,337	5,224,620

"The movement up to Feb. 1 shows an increase in the average weight as compared with the same period of the last two years, the average this year being 489.36 per bale, against 480.23 lbs. per bale for the same time in 1884-85, and 481.75 lbs. per bale in 1883-84."

Pennsylvania Railroad Coal Tonnage.

The coal tonnage of the Pennsylvania Railroad Division of the Pennsylvania Railroad for the year 1885 was as follows, in tons of 2,000 lbs:

	Coal.	Coke.	Total.
Originating on the line of Division:			
Snow Shoe, semi-bitum.	148,500	25,643	174,173
Karthaus, "	120,969	.....	120,969
Tyrone & Clearfield, "	2,873,876	.....	2,873,876
Gallitzin & Mount'n, "	550,244	193.091	743,335
West Pennsylvania, "	219,750	64.901	284,651
Southwest Penna., "	102,689	1,999,923	2,102,612
W'moreland region, "	1,293,813	252,397	1,546,210
Monongahela, "	267,502	108,706	376,208
Pittsburg, "	236,703	.....	236,703
North & West Branch, anthracite.	1,294,334	.....	1,294,334
Sun., Haz. & Wilkesb. "	321,192	.....	321,192
Total	7,429,572	2,644,661	10,074,233
Originating off the line of Division:			
Anthracite	3,087,831	.....	3,087,831
Semi bituminous	1,062,193	57,652	1,119,845
Total for year 1885	11,579,596	2,702,313	14,281,909
Total for year 1884	10,454,215	2,846,126	13,300,341

The increase in coal last year was 1,125,381 tons, or 10.8 per cent.; decrease in coke, 143,813 tons, or 5.1 per cent.; total increase, 981,568 tons, or 7.4 per cent.

Trans-Continental Traffic Association.

A fully attended meeeting of this Association began in New York, Feb. 9. So far the proceedings have been confined to general discussion of the situation and the appointment of a committee to prepare a new agreement and division of business.

Western Passenger Rates.

The Chicago, Milwaukee & St. Paul Co. last week made a heavy cut in passenger rates from Chicago to Council Bluffs, and also to St. Paul, the excuse for this action being an assertion that the agents of the Rock Island road have for some time been selling tickets below agreed rates. So far there is no evidence that the other lines have followed the St. Paul Co.'s cut, but it is altogether probable that they will do so. The passenger business at this time of the year, however, is very light, and the difficulty may be adjusted before it assumes serious proportions.

RAILROAD LAW.

Personal Damages—Negligence.

In the case of Fraser against the Charleston & Savannah Co., the Georgia Supreme Court reverses the decision of the Savannah City Court, holding as follows:

Although, in an action against a railroad company to recover damages for an injury alleged to have been done through the negligence of its employé in the performance of his duty connected with the running of its trains, the evidence on behalf of the plaintiff may not have been clear on several essential points, leaving it somewhat doubtful whether the plaintiff was injured by a person on board of the defendant's train or the train of another company which used the same track; or whether the injury was done by an employé acting within the scope of his duty, or was the result of his personal wrong while acting outside of his authority; or even whether the plaintiff had a right to be where she was when the damage was done to her; yet, as inferences favorable to her might have been drawn by the jury from the evidence, if left unexplained or uncontroverted on all of those points, and as negligence in the servants of the company was a question for the jury, a nonsuit should not have been awarded. Judgment reversed.

Obligation to Maintain a Levee.

In the case of Lawton and others against the Savannah, Florida & Western Co., the Georgia Supreme Court holds as follows:

1. Where land lay near a river, and between the river front and the highlands there was a tract lower than that fronting immediately on the river, and a wall or dam was kept up along the river front by the adjacent proprietors, to prevent the overflow of the lower lands further back, by reason of high tides and floods; and where one of such land owners sold a part of his lands, upon which was a portion of the bank or wall, to a railway company, and by reason of want of repair in the dam, some of the low lands were overflowed, and the crops of the occupant destroyed—whether or not the vender of the land on which the wall was would be liable, would depend upon the contract he made with the occupant of the lowlands when he rented to him. If he made no contract to keep up the bank, then he is not liable; if he did, he is liable. There was sufficient doubt on this subject to authorize the grant of a new trial in this case.

2. When the railroad company purchased the land along the river bank, having upon it a bank or wall which was part of a system adopted by the proprietors of land fronting on the river to keep back the floods and high tides, each proprietor was bound to the others to keep up and maintain the bank on his own land for the benefit of all; and upon the purchase by the railroad company, it assumed all the responsibility and liability resting on its vender as to keeping up and maintaining the wall or dam. This duty it owed to all the other proprietors, as well as to the occupants of the lowlands which were subject to overflow; and it would be liable for damages resulting from a neglect to observe this duty.

The grant of a new trial as to both defendants was right. Judgment affirmed.

OLD AND NEW ROADS.

Anniston & Atlantic.—It is understood that this company will shortly change the gauge of its road from 3 ft. to standard gauge, and will also at once begin work on the extension from the present terminus at Talladega, Ala., to Goodwater, the terminus of the Columbus & Western road. In connection with that road the road will form a through line from Anniston to Columbus, Ga., where connection is made with the Central Railroad of Georgia. The road is now in operation from Anniston, Ala., to Talladega, 30 miles.

Atchison, Topeka & Santa Fe.—Surveying parties are now at work running a line for the proposed extension of this company's line from Arkansas City, Kan., southward across the Indian Territory. It is understood that the present line is to run to Sherman, but it is not decided whether the final location will be on that line. Probably several lines will be run and it may be some time before a final decision is reached.

Baltimore & Ohio.—This company has purchased property on the shore of the Arthur Kill, at the point where the proposed bridge to Staten Island is to be built, and has also secured from the State Riparian Commissioners the grant of the land under water. It is reported that in case there is delay in securing permission to build the bridge, the company will build docks on each side of the Kill extending out to the channel and will bridge the channel with a floating pontoon, which can be towed out of the way when not in use for the passage of crains. Similar pontoon bridges have been used on the Mississippi River, and the plan is entirely practicable, while it is claimed that the structure can be used even if authority to build a permanent structure is denied, as it is considered legally as a ferry-boat, for the use of which no special authority is required.

Boston & Albany.—The quarterly reports to the New York Railroad Commission give the following figures for the quarter ending Dec. 31:

	1885.	1884.	Inc. or Dec.	P.c.
Earnings	$2,136,149	$2,015,259	I. $120,890	6.0
Expenses	1,382,239	1,286,221	I. 96,018	7.5
Net earnings	$753,910	$729,038	I. $24,872	3.4
Charges	586,709	666,041	D. 79,332	11.9
Surplus	$167,201	$62,997	I. $104,204	165.4

Charges include interest rentals and taxes. The dividend paid for the quarter was 2 per cent. in each year.

Boston, Hoosac Tunnel & Western.—This company's statement to the New York Railroad Commission for the quarter ending Dec. 31 is as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Earnings	$153,862	$132,420	I. $21,442	16.2
Expenses	116,475	142,532	D. 26,057	18.2
Net earnings	$37,387	$10,112*	I. $47,499	....
Interest and taxes	29,500	29,400	I. 100	0.3
Surplus	$7,887	$39,512*	I. $47,399	....

* Deficit.

The quarter has the best showing the road has ever made, as it earned a surplus over all charges, instead of showing a deficit.

Boston & Maine.—The suit brought in New Hampshire to restrain this company from leasing the Worcester, Nashua & Rochester road came up before the Supreme Court Feb. 9. It was agreed that answers must be filed within 30 days and be referred. The case will not be tried at this term.

Central Massachusetts.—It is said that the Boston & Lowell Co., which now operates this road, is completing plans for building an extension of the road from its present terminus at Jefferson to Northampton. A considerable part of this line has been graded and will not require much work to put it in readiness for the track. The object of the Boston & Lowell Co., it is supposed, is to secure a connection with the Hoosac Tunnel, and it is said that the company is already negotiating for the use of the New Haven & Northampton Co.'s line from Northampton to the tunnel.

Central, of New Jersey.—A meeting of the directors was held in New York, Feb. 5, at which a resolution was passed referring the recent decision of the Chancellor of New Jersey in the Vail case, pronouncing the lease to the Reading void to the officers of the company, with power to act under the advice of counsel. This, it is understood, means that application will be made to the Chancellor to place the road again under the management of Receiver Little.

In the United States Court in Philadelphia, Feb. 5, a long and elaborate answer was filed in the form of a bill of exception to the report of the Special Master recommending the termination of the lease of road to the Reading Co. The answer claims that the Master has not correctly stated the accounts and that the Central Co. owes the Reading a large amount in excess of the rental claimed to be overdue.

Chicago & Great Southern.—The Court has granted an order of foreclosure and sale for this road, fixing the minimum price at $500,000. This company is a consolidation in 1883 of the Chicago & Great Southern and the Chicago & Block Coal roads. In 1884 the company was placed in the hands of a receiver. The securities outstanding consist of $1,000,000 capital stock and $1,000,000 first-mortgage 6 per cent. bonds. The road extends from Fair Oaks, Ind., on the Louisville, New Albany & Chicago road, south to Yeddo, 76 miles. Some work has been done on an extension to Brazil.

Chicago & Northwestern.—This company is having a preliminary survey made for a branch of its Peninsula Division to run from Iron City, Mich., to Watersmeet, where it will connect with the Milwaukee, Lake Shore & Western road. The distance is about 30 miles.

Chicago, Rock Island & Pacific.—The first regular train over the new branch from Trenton, Mo., to St. Joseph was run Feb. 1. Only a mixed train is run at present, but additional passenger and freight trains will be put on shortly.

Cincinnati, Hamilton & Dayton.—A meeting was held in Cincinnati Feb. 2, at which a number of the larger stockholders were present, the object being to discuss the condition of the property and the prospects of the company. A committee of four stockholders was appointed to draw up an agreement providing for a trusteeship on an equitable plan and to present the same to all stockholders for their approval. The object of this movement, it is stated, is to secure stockholders generally against speculative raids on their stock and against attempts to purchase a controlling interest in the stock for the purpose of turning over the road to parties who have no interest in its welfare, but simply desire to secure control to use the road as part of a through line. The object is to secure such a majority of the stock as to render any purchase of the road impossible without the general consent of the stockholders.

Cincinnati, Indianapolis, St. Louis & Chicago.—The statement for December and the six months of the fiscal year from July 1 to Dec. 31 is as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Earnings	$205,706	$203,093	I. $2 613	1.3
Expenses	129,116	126,891	I. 2,225	1.7
Net earnings	$76,590	$76.202	I. $388	0.5
Fixed charges	50 000	50,000	.. ..	...
Surplus, December	$26,590	$26,202	I. $388	1.5
Surplus to Nov. 30	162,084	185,099	D. 23,015	12.4
Total surplus, 6 mos.	$188,674	$211,301	D. $22,627	10.7

For two months past there has been an improvement, which has been checked by snow blockades and bad weather in January

Cornwall.—Arrangements are being made to build a second track on this road from Lebanon, Pa., to Mt. Hope, 12 miles, and also to build an extension from Lebanon to North Lebanon for convenience in delivering ore.

Delaware & Hudson Canal Co.—This company's statement to the New York Railroad Commission gives the earnings of its two principal leased lines in New York for the quarter ending Dec. 31 as follows:

	Albany & Sus. 1885.	Albany & Sus. 1884.	Renss. & Sar. 1885.	Renss. & Sar. 1884
Earnings	$749,028	$572,232	$553,632	$496,810
Expenses	338,332	409,225	307,813	269,012
Net earnings	$410,696	$163,007	$245,849	$227,798
Other income	.....	.....	6,682	9,545
Total	$410,696	$163,007	$252,531	$237,343
Rental and taxes	251,603	274,712	211,949	250,864
Surplus	$159,093	*$111,705	$40,582	*$13,521

* Deficit.

The earnings of the minor leased lines were as follows for the quarter, the figures for the Utica, Clinton & Binghamton including the earnings of the Rome & Clinton road also:

	N. Y. & Canada. 1885.	N. Y. & Canada. 1884.	Utica, Cli. & B. 1885.	Utica, Cli. & B. 1884.
Earnings	$186,930	$158,117	$66 908	$60,619
Expenses	107,950	97,991	7,224	52,464
Net earnings	$78,980	$60,126	$59,684	$8,155
Rental and taxes	66,578	78,920	26,270	30,976
Surplus	$12,402	*$18,794	$33,414	*$22,821

*Deficit.

This statement shows an extraordinary increase on all the lines, the surplus over all charges in 1885 having been $245,491, against a deficit of $166,841 in 1884; a total net gain of $412,332 for the quarter.

Denver & Rio Grande Western.—The following statement is made for December and for the 17 months from the appointment of the Receiver to Dec 31 last:

	December 1885.	December 1884.	Seventeen months.
Earnings	$74,238	$98,830	$1,747,643
Expenses	56,734	64,338	1,309,133
Net earnings	$17,504	$34,492	$438,510
Taxes and rental of equipment			87,740
Balance			$350,770

The decrease in December is the first shown for nearly a year, and was largely due to the unfavorable weather.

East Tennessee, Virginia & Georgia.—The statement for December and the six months of the fiscal year from July 1 to Dec. 31 is as follows:

	December. 1885.	December. 1884.	Half-year. 1885.	Half-year. 1884.
Earnings	$408,554	$376,803	$2,227,459	$2,129,343
Expenses	212,912	246,373	1,246,946	1,274,304
Net earnings	$195,642	$130,430	$980,513	$855,039

For the half-year the gross earnings increased $98,116, or 4.6 per cent., and the expenses decreased $27,358, or 2.2 per cent., the result being a gain of $125,474, or 14.5 per cent., in net earnings.

The bondholders' committee has agreed upon a plan of reorganization, which, it is stated, has already received the approval of the holders of a large amount of the bonds. Foreclosure is to be made under the present consolidated mortgage, and a new consolidated mortgage is to be created for $20,000,000, bearing 5 per cent. interest and having 70 years to run. Enough of these bonds will be reserved to pay off the old liens as they mature, and the balance will be used for taking up the present consolidated mortgage bonds, the Cincinnati & Georgia bonds, and the ten-year debentures, on the terms specified for each. The whole interest charge under the new arrangement will be $994,737 per year, which it is believed the company should easily meet, and the cash fund in hand for improvements and liquidation of car trusts will be $2.475,000, with a surplus also of $1,534,000 new consol. bonds in the treasury, available for future use. A summary of the plan is as follows:

"1. The consolidated mortgage bondholders will be offered for their present bonds and the accrued interest thereon up to Jan. 1, 1887 (including two-thirds of the coupon of Jan. 1, 1887), new consolidated bonds for 60 per cent. of the amount so made up, and first preferred stock for 50 per cent. of such amount.

"The holders of Cincinnati & Georgia divisional mortgage bonds, and the holders of the debenture bonds of 1894, will receive new consols for 48 per cent. of their bonds and coupons, and first-preferred stock for 62 per cent. of said amounts, the accrued interest on the Cincinnati & Georgia including coupons up to March 1, 1887, and one-third of the coupon then maturing, and the accrued interest on debenture bonds including five sixths of the coupon maturing Dec. 1, 1886.

"3. Income bondholders are to pay a cash assessment of 5 per cent. and will receive second-preferred stock at par for the face of their bonds and first-preferred stock for the 5 per cent. cash assessment paid.

"4. Preferred stockholders are to pay a cash assessment of 6 per cent. on their shares and will receive new common stock at par for their present stock and new second-preferred stock for the cash assessment paid.

"5. The present common stock is to pay a cash assessment of 2.4 per cent. and will receive for the face value of the present shares 40 per cent. in new common stock and for the cash assessment paid par in new second preferred stock."

As reorganized under this plan the company will have outstanding $7,325,000 divisional bonds; $12,675,000 consolidated 5s; $11,000,000 first-preferred stock; $18,500,000 second preferred stock, and $27,500,000 common stock. The interest charge (including that on bonds retained in the treasury) will be $1,071,460 yearly, which will be reduced to $1,000,000 when the divisional bonds are replaced by consols as they mature. Should all the assessments be paid as proposed, the company would have $2,475,000 in cash to apply to improvements of road and payment for equipment, and it will also have $1,534,460 consols in the treasury to apply to the same purpose. It will also have $178,915 first-preferred and $350,000 second-preferred stock in the treasury.

Fairmont, Morgantown & Pittsburgh.—Track on this road is now laid to Morgantown, W. Va., 6 miles beyond the terminus at the close of the year, and 26 miles from the starting point at Fairmont. Tracklaying will be continued northward as soon as the bridge at Morgantown is completed.

Florida Railway & Navigation Co.—The Receiver has been authorized by the Court to expend $800,000 in putting this company's line in good condition and in completing the construction of branches and extensions already begun. A portion of this amount will be used in increasing the equipment.

Fremont, Elkhorn & Missouri Valley.—On the extension of this line from Chadron, Neb., westward, much of the work has been completed on the first section of 60 miles. A contract has been let for the grading of 79 miles more, which will bring the end of the road nearly to Fort Fetterman. Track-laying on the Black Hills branch, from the present terminus at Buffalo Gap, Dak., will be resumed as soon as the weather permits, with the intention of completing the line early in the spring.

Galveston, Sabine & St. Louis.—The legality of the recent election of directors by this company is disputed and a second opposition board has been chosen by a portion of the stockholders. The claim is that at the annual meeting the President refused to receive the votes offered by parties who held properties from the Galveston & St. Louis Construction Co., and that President Barner not only rejected those proxies but voted on the stock himself. It is claimed that the Construction Co., under the agreement, is entitled to a majority of the stock and legally holds such a majority, but that owing to the arbitrary action of the President its representative was unable to vote. The question will probably be carried to the courts for decision. The party opposed to the Construction Co.'s management claims that the company has not fulfilled its agreement, and is consequently not entitled to any stock at all.

Georgia Midland.—The project of building this road directly from Columbus, Ga., to Atlanta has been revived, and an attempt is being made to raise subscriptions in Atlanta to secure the construction of the road. The city of Columbus has already subscribed $150,000, and an attempt will be made to raise an equal amount in Atlanta. So far, the projectors have met with considerable success, and it is thought that the amount can be raised without difficulty.

Grand Rapids & Indiana.—The car repair shops of this road at Grand Rapids, Mich., caught fire on the night of Feb. 5, and were entirely destroyed, notwithstanding the efforts of the local fire department. With the shops a sleeping car, 4 passenger cars, a baggage car and 9 freight cars were destroyed. The total loss is estimated at $80,000, which is partly covered by insurance. The roundhouse adjoining the repair shops was saved, and the yardmen were also successful in getting out some of the cars which were in the shop. It is thought that the fire started from a stove in the paint shop.

Great American & European Short Line.—Dr. Norvin Green and others representing the New York syndicate, which last year made an unsuccessful attempt to build this projected road, have petitioned the Governor-General of Canada to disapprove the act passed by the Legislature of Nova Scotia at its last session, ratifying and making valid an agreement made by an agent of the company by which all the property of the company is to be transferred to the contractors who graded a part of the road in Nova Scotia. The company in its petition claims that the

Nova Scotia Legislature has no right to act in the matter, as the company was incorporated under an act of the Dominion Parliament. The company also claims that it has been prevented from carrying out its agreement with the government because of the repudiation of the present Dominion Minister of Railways of the contract made with the company by his predecessor.

Greenville & Western North Carolina.—This company has filed articles of incorporation to build a railroad from Unaka, Tenn., on the East Tennessee, Virginia & Georgia road, to Greenville.

Gulf, Colorado & Santa Fe.—A committee of the board of directors has accepted the proposition made by the citizens of Dallas to start the northern extension of the road through the Indian Territory from that place, the Dallas committee tendering a guarantee of $50,000 in money and the right of way through the county. The line has not been definitely located, but it is understood that surveying parties will be put on the road at once.

Housatonic.—Suits have been begun against this company by the District Attorney for the state to recover about $2,000 damages for excessive freight tolls since the Railroad Commissioners ordered the rate of 10 cents per 100 lbs. after August 1. Ten counts are brought in the allegation, on the claims of P. C. Baird of Lee, the Smith Paper Co. of Lee, the Hurlburt Paper Co. of South Lee and A. C. Sparks of Lee, who paid 15 cents during October. The defendant's answer claims that the Commissioner's ruling was unconstitutional and void.

Kansas City, Fort Scott & Gulf.—This company makes the following statement for the year ending Dec. 31:

	1885.	1884.	Inc. or Dec.	P.c.
Earnings	$2,546,525	$2,422,442	I. $124,083	5.2
Expenses	1,557,091	1,407,693	I. 149,398	10.6
Net earnings	$989,434	$1,014,749	D. $25,315	2.5
Interest, rentals, etc.	628,304	543,244	I. 85,060	15.7
Surplus	$361,130	$471,505	D. $110,375	23.4

The working expenses were 61.2 per cent. of gross earnings in 1885, against 58.1 in 1884. From last year's surplus dividends amounting to 8 per cent. on the preferred stock have been paid, requiring the sum of $219,960, and leaving a balance of $141,170, which is equal to 3.04 per cent. on the common stock. From this a dividend of 2¼ per cent. is now declared, amounting $116,200, which will leave a balance of $24,970 to surplus account.

Lackawanna & Pittsburgh.—In Buffalo, Feb. 8, the Supreme Court made an order authorizing Receiver Chapman to borrow $50,000 at not more than 6 per cent. interest, and to issue his notes at six months for the amount. The money borrowed is to be appropriated as follows: $25,000 to pay amount due employés of the road; $5,000 to pay taxes due; the remaining $20,000 to be deposited in bank subject to further orders of the Court.

Lebanon Springs.—For the quarter ending Dec. 31 the gross earnings reported were $24,730, and the expenses $20,717, leaving $4,013 as net earnings.

Little Rock & Fort Smith.—Land sales for December were 3,431 acres, for $10,959. The total land sales for 1885 were 29,800 acres, for $107,104. Nothing has been made public in regard to the proposed sale of the entire land grant concerning which reports have been circulated.

Louisville & Nashville.—The following statement is made for the half year from July 1 to Dec. 31:

Gross earnings from traffic		$6,788,839
Working expenses		4,107,980
Net earnings		$2,680,859
Income from investments		77,553
Total net income		$2,758,412
Interest, rentals and taxes	$2,257,694	
New construction	146,427	
		2,404,121
Surplus for the half-year		$354,291

For the corresponding period in 1884 the surplus reported was $716,715, showing a decrease in 1885 of $362,424, or 50.5 per cent., for the half-year.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Jan. 30:

Work is being vigorously pushed on the Yucatan Eastern Railroad on the branch from Merida to Conkal, and by the end of February it is expected that the track will be completed and laid with sleepers.

The *Diario Oficial* states that the loss to the Government by the fire on the Tehuantepec Railroad will be small. Its loss is estimated at but $1,250, while the contractor loses a steam engine and other machinery.

The Mexican Central Customs Agent at El Paso, Mr. T. J. Woodside, has greatly improved the methods of dispatching goods from that point to this capital and the interior of the republic. The Central's freight service was never better managed than now.

Minneapolis, Sault Ste. Marie & Atlantic.—It is stated that arrangements have been made for the necessary funds to pay for the extension of this road from its present terminus eastward to Rhinelander, where it will connect with the Milwaukee, Lake Shore & Western road, and work will be begun on this extension as soon as the weather will permit.

It is understood also that negotiations are in progress, which, if successful, will enable the company to enter actively this season upon the work of extending its line eastward to the Sault Ste. Marie. Negotiations are also pending with the Canadian Pacific for an agreement which will require that company to complete its branch to the Sault at the same time, in order that the road may secure through connection eastward by rail as well as by water.

New York Central & Hudson River.—The report to the Railroad Commission for the quarter ending Dec. 31 is as follows:

	1885.	1884.	Inc. or Dec.
Earnings	$6,876,602	$6,810,170	I. $66,432
Expenses	4,135,209	3,933 086	I. 202,123
Net earnings	$2,741,393	$2,877,084	D. $135,691
First charges	1,467,000	1,500,000	D. 33,000
Balance	$1,274,393	$1,377,084	D. $102,691
Dividends paid	894,283	1,341,424	D. 447,141
Surplus	$380,110	35,660	I. 344,450

The foregoing shows a balance of earnings applicable to the stock for the last quarter ended Dec. 31, 1885, of 1.43 per cent., against 0.10 for the preceding quarter ended Sept. 30, 1885, and a surplus after the payment of 1 per cent. dividend of $380,100, against a deficit of $357,659 after the payment of ½ per cent. for the quarter ended Sept. 30. The balance sheet of Dec. 31 shows the company's net floating debt on that date to have been practically the same as it was on Sept. 30,

Newport, Cape Foulweather & King's Valley.—This company has filed articles of incorporation to build a railroad from Newport, Ore., or Cape Foulweather, eastward to a connection with the Oregonian Railroad in King's Valley, the distance being about 45 miles. The proposed line is parallel to and a little north of the Oregon Pacific road.

Northern Pacific.—This company's statement for December and the six months of the fiscal year from July 1 to Dec. 31 is as follows:

	December.		Half-year.	
	1885.	1884.	1885.	1884.
Earnings	$775,371	$758,229	$6,743,270	$6,627,719
Expenses	468,820	417,721	3,102,289	3,268,150
Net earnings	$306,551	$340,508	$3,640.981	$3,359,569
Interest, rentals, taxes, etc			3,010,011	2,660,283
Surplus			$630,970	$699,286

The half-year shows an increase in gross earnings of $115,551, or 1.7 per cent.; an increase in net earnings of $281,412, or 8.4 per cent., and a decrease in the surplus of $68,316, or 9.8 per cent.

The funded debt outstanding Jan. 1, 1886, was as follows: General firsts, $44,028,000; general seconds, $18,857,000; Missouri and Pend d'Oreille Division firsts, $5,423,500: dividend certificates, $4,640,821; total, $72,949,321. From this amount should be deducted $365,000 general firsts bought for the sinking fund, leaving a total of $72,584,321, on which the yearly interest charge is $4,355,059.

The company has in the treasury $3,512,000 unsold firsts and $1,143,000 seconds. The total cost of completing the Cascade Division is estimated at $5,912,000, or $1,257,000 in excess of the unsold bonds on hand.

Regarding the proposed sale of the land east of the Missouri River negotiations are still pending, but it is stated that the prospects are that the sale will be completed. It will cover all the company's land east of the Missouri, about 4,000,000 acres in all. If completed it will reduce the amount of the preferred stock by about $10,000,000.

Paspebiac.—This company has concluded a contract with James Isbester and P. J. Brown for the construction of its road, which is to run from the Intercolonial road at Metapediac, Que., along the north shore of Chaleur Bay to Paspebiac. The road will be 93 miles long, and portions of it are through a rough and difficult country. It will run through a thinly settled district inhabited mainly by fishermen. The company will receive a subsidy of $6,400 per mile from the Dominion government, and is also promised a subsidy from the province of Quebec.

Philadelphia & Reading.—The Philadelphia *Ledger*, which has unusual opportunities for securing information, and which does not usually speak unless well informed, says:

"The movement for the reorganization of the Reading Railroad upon a stable and solvent basis makes steady progress. The syndicate, who contemplate the task have for their chief object the harmonizing of all conflicting interests in the anthracite coal trade. Out of this, as well as from the wish on the part of great financial interests to remove the chief disturbing factor from the general monetary situation, the desire springs for a final and satisfactory settlement of Reading affairs. The syndicate which is to undertake it is mainly a New York combination composed of the strongest houses and some of the most prominent financiers of that city, with whom are also joined leading houses in this city, Boston, London and elsewhere. Among the many members of the syndicate who have determined to co-operate in the work are Drexel, Morgan & Co., Brown Brothers & Co., J. S. Morgan & Co. (of London), Brown, Shipley & Co. (of Liverpool and London), Winslow, Lanier & Co., Drexel & Co., John Lowber Welsh, John Jacob Astor, Robert Lenox Kennedy and other capitalists. All of the great anthracite coal interests of the country have also been brought into harmonious relations with and support of the syndicate, notably the Delaware, Lackawanna & Western Railroad, the Delaware & Hudson Canal Co. and the Lehigh Valley Railroad. Sympathy is also given the movement by the Lehigh Navigation and the Pennsylvania Coal companies, and by the men who control the various trunk lines that are also coal carriers. With the strongest banking houses actively co-operating and the sympathetic support of every business interest that might be averse, the backing of this great combination can well be recognized, and the ultimate success of its movements confidently anticipated. We are informed that the Pennsylvania Railroad management have been aiding by advice, and have expressed assurances of their intention to give the reorganized company fair treatment in traffic agreements and all railroad relations, they having a large anthracite coal interest, which will be made larger upon the completion of their Schuylkill Valley road to Pottsville.

"The Reading Reconstruction Trustees will reconvene shortly, and expect to receive through John C. Bullitt, Esq., the counsel for leading members of the syndicate, a written statement of its intentions and desires. We understand that in general terms the syndicate will request to be given control over Reading affairs for such period of time as may be necessary to carry out whatever plan of reorganization may be hereafter agreed upon. This plan being adopted and the control given in such manner, either by a Voting Committee or a Board of Trustees, as may be ultimately decided, the syndicate will then ask every bond and stock holder of the Reading Companies to come forward, deposit their bonds and stock, and express acquiescence in the plan. Part of the deposits, including the general mortgage bonds, will be made with Drexel, Morgan & Co. and Drexel & Co., and part with Brown Brothers & Co. Every class of bonds, debentures, stock, deferred bonds, etc., will be included in the plan, every one having any financial interest in Reading—near or remote—being included, and thus given the opportunity to participate in the reorganization. The syndicate also will propose to go much further than to merely act as an agent for reconstruction. It will guarantee the twelve or more millions of dollars estimated as necessary for reorganization in order to pay off the Receivers' certificates, interest advances and other first charges, and to put the road in good condition; and will ask that this be provided by contributions from the junior bondholders and the stockholders. Those contributing will in each case be reimbursed by allotments of preferred stock, while all those declining to come in will have their payments assumed by the syndicate, so that the reorganization will go through without risk of failure on account of money not being forthcoming. Notice will be given of a definite and ample time within which all interested can express approval and make deposit of their securities. After the expiration of the time, all not acquiescing will be cut off by foreclosure; the syndicate will then assume their obligations, and this ultimate foreclosure will deprive them of any interest in the reorganized company.

"The syndicate plan embraces the broad policy of keeping al the Reading properties intact. When put into operation the syndicate intend to pursue legally every measure necessary to enforce the plan, without regard to who may oppose it. The length of time necessary to accomplish this result will depend largely upon the temper of the United States Court in dealing with those who may desire to avail of legal quibbles for obstruction or delay. It may take one, two or three years, and in the mean time the Receivers under the instructions of the Court are expected to continue the traffic and financial management of the road as at present. The details of the syndicate's financial plan are not yet concluded, and may be changed in various particulars to meet the views of creditor interests, all of which are now being consulted. The plan is to be a flexible one, much latitude being regarded as necessary in dealing with these varied and complex subjects. The first principle observed is that the fixed charges to be put upon the newly reorganized road are not to be greater than a sum which, with 5 per cent. interest on the proposed new preferred stock, will come within the amount of Reading's net annual earnings. The present Reading general mortgage is to be replaced at par by a 4 per cent. long mortgage bond. The amount of this new mortgage is indefinite as yet, but it will be sufficient to cover the present general mortgage issue, the real estate mortgages and all prior liens (when they expire), say $59,000,000, and also the divisional coal land mortgages of the Reading Coal & Iron Co., which are yet to have their proportions arranged. Everything that is subsequent in lien to these mortgage bonds, commencing with the income mortgage, is expected to contribute a cash assessment, the amount of assessment in each case not yet being definitely fixed, but the aggregate sum to be produced by all the assessments being about $12,000,000. For these cash assessments, dollar for dollar, and also for the overdue general mortgage coupons, and for the interest above 4 per cent., which the general mortgage surrenders, first preferred stock will be issued, while for the contributions, not in cash (but in kind) made by various alternative processes to be proposed in the flexible plan, second preferred stock or common stock will be issued. The details of these assessments and contributions are yet to be arranged, and are at present a subject of negotiation with those who are representing various classes of creditors. The floating debt of the Reading companies, other than the Receivers' certificates and first charges, which must be paid off in cash, will be valued in accordance with the value of the collaterals pledged for it, each particular item of debt and collateral being a subject of separate negotiation and settlement. While the syndicate are in active consultation with the present Reading Reorganization Trustees, and are desirous of acting in amicable record with them, we are informed that it is not regarded as a necessary factor in the plan that these Trustees shall accept it. Their advice and assistance is desired, but it is not indispensable, and it is possible, if very divergent views are expressed, that the syndicate may have to proceed without the concurrence of some of these Trustees.

"The net earnings of the Reading companies, exclusive of New Jersey Central, in the fiscal year ended Nov. 30, 1885, were reported by the Receivers as $7,926,304, and the desire is to bring the fixed charges within this sum. The plan of the Reading Reconstruction Trustees, in its present shape, we are informed, embraces the following: The general mortgage in lieu of each existing $1,000 bond, is to get a $1,000 new 4 per cent. bond, and also $520 preferred stock for the 6s, and $540 preferred stock for the 7s, to cover the overdue coupons and surrender of interest over 4 per cent. The income mortgage bonds, convertible adjustment scrip and first series 5 per cent. consols are to pay a cash assessment of 10 per cent. on their par value, and will get in return $100 first preferred stock (for their assessment) and also $1,000 second preferred stock, representing the par value of their bonds and scrip surrendered, also such additional second preferred stock as will equal at par five coupons on the incomes and four coupons on the first series 5s. The second series 5s, the convertible 7s and the debenture bonds of the railroad and the coal companies are asked to pay an assessment of 15 per cent., and for each $1,000 bond and overdue coupons will receive $150 first preferred stock (for their assessment), and $1,000 common stock for the bond. All unsecured claims, when properly proven, will be given the same recognition as the debenture bonds of the company. The present existing Reading stock is to pay $10 per share cash assessment, and in return will get for each share $10 first preferred stock and $50 common stock. The deferred income bonds are to pay 2½ per cent. assessment, and will get for each bond $25 first preferred stock (for the assessment) and $200 common stock. Under this plan the first preferred stock gets the earnings beyond fixed charges, up to 5 per cent. annually, non-cumulative; the second gets 5 per cent. annually, non-cumulative after the first preferred is supplied. The theory of the Trustees' plan is that, if it is carried out, the now Reading mortgage obligations will be within $61,000,000, and the fixed charges about $7,300,000 annually. The issue of first preferred stock under the Trustees' plan will be about $25,500,000, with an annual interest charge of $1,275,000; the second preferred stock will be about $20,500,000, with $1,020,000 annual interest charge; and the common stock will be about $60,100,000. The Trustees' plan in the aggregate contemplates cash assessments of nearly $12,600,000. Our readers should bear in mind that the summary here given is the Re-construction Trustees' plan, and not the Syndicate plan, the latter not being yet formulated in detail, although it may assimilate to this plan but may be changed in detail, and in fact suggested changes are already being made in various particulars."

Providence & Springfield.—It is proposed to build a branch of this road from Primrose, R. I., 14½ miles from Providence, to Woonsocket, a distance of 4 miles. The branch will probably be built by a new company and leased to this company. Its construction depends upon the amount which manufacturers on the proposed line are willing to subscribe.

It is understood that an attempt will be made shortly to secure the extension of the main line of the road from its present terminus at Pascoag, R. I., westward to Webster, where it will connect with the branch of the Boston & Albany.

Providence, Warren & Bristol.—At a special meeting of the stockholders in Providence, R. I., Feb. 8, it was voted to extend the road from its present terminus at India Point in Providence to the Weybosset bridge in the centre of the city. The president and directors are authorized to make the necessary application to the Legislature and to the City Council for permission to build the extension, and also to borrow the money required to build it—the same not to exceed $150,000.

Rapid City & Southwestern.—This company has been organized to build a narrow-gauge road from Rapid City, Dak., in the Black Hills region, southwest to the Harney & Hill City mining districts.

Rome, Watertown & Ogdensburg.—The statement for December and the three months of the fiscal year from Oct. 1 to Dec. 31 is as follows:

	December.		Three months.	
	1885.	1884.	1885.	1884.
Earnings	$156,092	$138,590	$505,799	$471,319
Expenses	104,270	92,963	309,978	293,450
Net earnings	$51,822	$45,627	$195,821	$177,869

Taxes are included in expenses. For the three months the gross earnings increased $34,480, or 7.3 per cent., and the expenses $16,528, or 5.6 per cent., the result being a gain of $17,952, or 10.1 per cent., in net earnings.

St. Louis, Arkansas & Texas.—This company has been fully organized in Texas by the representatives of the

bondholders who bought the Texas Division of the Texas & St. Louis road at foreclosure sale. A company of the same name will be organized in Arkansas as soon as the sale of the road in that State is completed. It is understood that the Texas company will not take possession of the road until after the sale of the other division.

South Pennsylvania.—The defendant parties in the injunction suit have filed formal notice of appeal to the Supreme Court from the decision of the Court of Common Pleas continuing the injunction against the sale of this road to the Pennsylvania Railroad and the Bedford and Bridgeport companies.

Toledo, Cincinnati & St. Louis.—The question of confirmation of the recent foreclosure sale came up in the United States Circuit Court in Indianapolis, Feb. 5. The Court made an order confirming the sale to the bondholders' committee, but the question of dividing the proceeds of the sale was not finally settled, and an order was made giving all creditors both of the old road and of the Receiver until March 1 to file their claims. The Master's preliminary report stated that the claims amounted to about $800,000, but it is probable that they will be largely increased. When they are all finally filed and reported to the Court it will proceed to take action on the final division of the purchase money.

Union Pacific.—The statement for December and the year ending Dec. 31 is as follows, including all lines worked:

	December		Year	
	1885.	1884.	1885.	1884.
Earnings	$2,348,486	$2,319,585	$25,925,171	$25,657,290
Expenses	1,418,363	1,228,347	16,157,720	14,868,115
Net earnings	$930,123	$1,091,238	$9,767,451	$10,789,175
Per cent. of exp.	60.4	53.0	62.3	57.9

For the year this shows an increase in gross earnings of $267,881, or 1.0 per cent., and an increase in expenses of $1,289,605, or 8.7 per cent., the result being a decrease of $1,021,724, or 9.5 per cent., in net earnings.

The total land sales in January were 10,387 acres for $48,764, against 40,716 acres for $95,581 in January last year.

In response to a resolution of the Kansas Senate, the Attorney General of the state has submitted a special report in relation to the disposition of the *quo warranto* suits brought by the state against the Union Pacific and the Kansas Pacific companies. It will be remembered that last year the Legislature accepted a proposition made by the company and directed that the suit be dismissed, but the company has not yet complied with its part of the agreement. The Attorney General enumerates various instances in which the company has failed to perform its agreement, and states that he notified the company and received assurances that the failures were due to oversight and would be speedily corrected. Up to the present time, however, no change has been made, and he suggests that unless the company speedily complies with the requirements that the suits will be reinstated.

West Shore.—An agreement has been finally closed under which the Buffalo shops of this company will be leased to the New York Central Sleeping Car Co., as already reported. The shops will be used exclusively for the repair and construction of the company's sleeping and parlor cars and will probably be extended and enlarged.

Wichita & Colorado.—Track is now laid on this road to Andale, Kan., 23 miles west of Wichita, the starting point. Trains began to run regularly over the line Feb. 1. It will be operated as a branch of the St. Louis, Fort Scott & Wichita road.

Wilmington, Chadbourn & Conwayboro.—This road is now completed from Chadbourn in Columbus County, N. C., on the Wilmington, Columbia & Augusta road, southward to Mt. Tabor, a distance of 14 miles. It was originally begun as a lumber road, but has been ballasted and put in good order for general traffic. It was extended 4½ miles last year.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

Mississippi & Tennessee.

This company owns a line from Memphis, Tenn., to Grenada, Miss., 100 miles. The report is for the year ending Sept. 30.

The earnings for the year were as follows:

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Freight	$357,684	$405,806	D. $48,122	11.8
Passengers	117,378	126,540	D. 9,162	7.2
Mail, etc.	14,486	12,670	I. 1,816	14.3
Total	$489,548	$545,016	D. $55,468	10.2
Expenses	336,135	294,570	I. 41,565	14.1
Net earnings	$153,413	$250,446	D. $97,033	38.7
Gross earn. per mile.	4,895	5,450	D. 555	10.2
Net " "	1,534	2,504	D. 970	38.7
P. c. of expenses	68.7	54.0	I. 14.7	....

The report says: "The decrease in gross receipts is in part attributed to the opening of other new railway routes to New Orleans and other Southern ports. The Louisville, New Orleans & Texas Railroad has been in operation during the greater part of the period of the corporate year, and the Memphis, Selma & Brunswick Railroad during several months of the corporate year. They are legitimately entitled to a share of the through business which the Mississippi & Tennessee Railroad in former years commanded. The decrease of 10,627 bales of cotton shipped from local stations on the road explains in part the deficit in local receipts from passengers as well as freight—the cotton crop and its prices being generally regarded the standard of the country's prosperity.

"The decrease in net earnings is satisfactorily accounted for by the purchase of two freight locomotives at a cost of $14,600, and replacing an old wooden bridge across Tallahatchie River with an iron one, at a net cost of $31,282, making a total of $45,882 paid out of the receipts of the road and charged to operating expenses. Deducting these betterment expenditures, the amount expended in operating expenses will compare favorably with last year."

As to the financial condition of the company, the Treasurer's report shows a floating debt of $103,344, against assets amounting to $211,606.

New London Northern.

This company owns a line from New London, Conn., to Brattleboro, Vt., 121 miles. It is leased to J. Gregory Smith and associates, and operated in the interest of the Central Vermont. The report is for the year ending Sept. 30.

The equipment includes 23 locomotives; 13 passenger and 14 baggage, mail and express cars; 320 freight cars and 8 service cars.

The general account was as follows

Stock		$1,500,060
Funded debt		1,499,500
Unfunded debt		178,963
Profit and loss		398,089
Total		$3,576,552
Road and property	$3,293,052	
Cash and cash assets	283,500	
		3,576,552

There was no change in stock or bonds during the year.

The traffic moved was as follows:

	1884-85.	1883-84.	Decrease.	P.c.
Passengers	407,351	412,073	4,722	1.1
Tons freight	417,051	504,848	87,197	17-2

Revenue trains ran 408,194 miles last year. The average rate per passenger-mile was 3.18 cents; per ton-mile, 1.64 cents.

The earnings for the year were as follows:

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Earnings	$552,065	$578,222	D. $25,757	4.5
Expenses	337,553	339,765	D. 2,212	0.6
Net earnings	$214,912	$238,457	D. $23,545	9.9
Gross earn. per mile	4,566	4,779	D. 213	4.5
Net " " "	1,776	1,971	D. 195	9.9
Per cent. of expenses	61.1	59.7	I. 1.4	...

Earnings include rents received, and expenses include taxes paid in both years.

The result of the year was as follows:

Net earnings, as above		$214,912
Interest	$101,391	
Dividends, 6 per cent	90,000	
		191,391
Balance, surplus		23,521

Expenditures on construction account were $29,860 for the year. During the year one passenger and two other persons were killed, and one employé was injured.

Norwich & Worcester.

This company owns a line from Worcester, Mass., to Allyn's Point, Conn., 66.4 miles. It is leased to the New York & New England Co., but a separate report is made for the year ending Sept. 20.

The equipment includes 17 locomotives; 10 passenger, 4 sleeping and 3 baggage cars; 556 freight cars, and 9 service cars.

The general account is as follows:

Stock		$2,604,400
Bonds		400,000
Other liabilities		972,134
Total		$3,976,534
Road and property	$3,352,504	
Cash and cash assets	624,030	
		3,976,534

There was no change in the stock or bonds during the year.

The traffic for the year was as follows:

	1884-85.	1883-84.	Inc. or Dec.	P.c.
Pass. train-miles	175,848	169,256	I. 6,592	3,9
Freight train-miles	162,752	172,021	D. 9,269	5,4
Passengers carried	507,233	454,011	I. 53,222	11.7
Passenger-miles	8,007,221	7,894,888	I. 112,333	1.4
Tons freight carried	546,059	609,864	D. 63,805	10 4
Ton-miles	18,910,944	25,107,525	D. 6,196,581	24.7
Av train load:				
Passengers, No	45.5	46.6	D. 1.1	1.3
Freight, tons	116.2	146.0	D. 29.8	10.4

Of the freight traffic 59.7 per cent. last year was of business to and from other roads.

The earnings for the year were as follows:

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Earnings	$750,482	$761,901	D. $11,419	1.5
Expenses	427,988	464,387	D. 36,399	7.8
Net earnings	$322,494	$297,514	I. $24,980	8.4
Gross earn. per mile	11,302	11,474	D. 172	1.5
Net " "	4,857	4,481	I. 379	8.4
Per cent. of expenses	57.0	61.0	D 4.0	....

Taxes are included in the operating expenses.

The payments from net earnings were:

Net earnings, as above		$322,494
Rentals	$40,050	
Interest	24,396	
Dividends, 9 per cent	233,802	
		298,248
Balance, surplus for the year		$24,246

During the year an agreement was made with the lessee under which the dividends required by the lease were reduced from 10 to 8 per cent. yearly. One dividend of 5 and one of 4 per cent. were paid, making 9 per cent. for the year.

Portland & Ogdensburg.

This company owns a line from Portland, Me., to Fabyan, N. H., 91 miles, with a short section from Scott's Mills, N. H., to Lunenburg, Vt., 3 miles. This section is connected with the main line by the Boston, Concord & Montreal track from Fabyan to Scott's Mills, 20½ miles. The road is in possession of a Receiver, whose report is for the year ending Sept. 30.

The equipment includes 15 locomotives; 25 passenger train cars; 104 box, 158 flat and 9 caboose cars; 22 service cars, 3 snow-plows and 1 steam excavator.

On Nov. 12, 1885, the road became the property of the bondholders under a decree of strict foreclosure of the mortgage of 1871 for $2,377,000, they acquiring possession subject to the first mortgage for $800,000 and the Receiver's debts. The new owners have not yet organized.

The earnings for the year were as follows:

	1884-85.	1883-84.	Inc. or Dec.	P.c.
Freight	$212,361	$186,991	I. $25,370	13.6
Passengers	135,030	133,489	I. 1,541	1.1
Mail, etc.	14,602	14,193	I. 409	2.9
Total	$361,993	$334,673	I. $27,320	8.2
Expenses	262,836	244,792	I. 18,044	7.3
Net earnings	$99,157	$89,881	I. $9,276	10.3
Gross earn. per mile	3,851	3,560	I. 291	8.2
Net " " "	1,055	956	I. 99	10.3
Per cent. of exps	72 6	73.2	D. 0.6	....

Expenditures for improvements and additions to property last year were $86,361, leaving a balance of $12,796.

On June 5, 1885, the contract under which trains were run over the Boston, Concord & Montreal track from Fabyan to Scott's Mills expired. As it could not be renewed on any terms that the business would warrant, an agreement was made under which the spur from Scott's Mills to Lunenburg is operated by the Boston & Lowell Co., lessee of the Boston, Concord & Montreal road.

The traffic for the year was as follows:

Train miles:	1884-85.	1883-84.	Inc. or Dec.	P.c.
Passenger	148,665	154,140	D. 5.475	3.6
Freight	162,770	109.836	I. 52.934	48.1
Service and switching	77,890	59,239	I. 18,651	31.6
Total	389,325	323,215	I. 66,110	20.5
Passengers carried	153,780	140,218	I. 13,562	9.7
Passenger-miles	4,528,253	4,110,140	I. 418,113	10.2
Tons freight carried	263,530	206,813	I. 56,717	27.4
Ton-miles	14,499,727	9,095,696	I. 5,404,031	59.4
Av. train load:				
Passenger, No	30.5	26.7	I. 3.8	14.2
Freight, tons	89.1	82.8	I. 6.3	7.6

Of the ton-mileage last year 75.7 per cent. was of freight to and from other loads.

During the receivership extensive improvements have been made in renewing the track with steel, replacing wooden bridges with iron, filling trestles, widening cuts and ditching road-bed, and generally in putting the line and its equipment in good working order, and in building shops and yards at Thompson's Point, near Portland.

Huntingdon & Broad Top Mountain.

This company owns a line from Huntingdon, Pa., to Mt. Dallas, 45 miles, with 19 miles of coal branches. The following statements have been published for the year ending Dec. 31.

The company has $1,368,650 common and $1,984,600 preferred stock. The funded debt consists of $416,000 first 7s, $367,500 second 7s; $1,497,000 consolidated 5s, and $118,895 interest scrip.

The earnings for the year were as follows:

	1885.	1884	Increase.	P. c.
Earnings	$371,001	$333,560	$37,441	11.2
Expenses	179,292	157,836	21,456	13.6
Net earnings	$191,709	$175,724	$15,985	9.1
Gross earn. per mile	5,797	5,212	585	11.2
Net " "	2,995	2,747	248	9.1
Per cent. of exps	48.5	47.3	1 2	...

Of the gross earnings $191,118 were derived from coal, $23,907 from coke, $87,896 from merchandise freight, $43,017 from passenger and the balance from mails and miscellaneous sources.

Interest on the funded debt amounts to $138,018 yearly, and this amount deducted from net earnings leaves a surplus of $53,691, which is equal to 2.71 per cent. on the preferred stock.

Providence & Worcester.

This company owns a line from Providence, R. I., to Worcester, Mass., 43.41 miles, with a branch to East Providence, 7miles, making 50.41 miles of road. There are 42.38 miles of second track and 38.55 miles of sidings. The report is for the year ending Sept. 30.

The equipment includes 37 locomotives; 40 passenger and 13 baggage, mail and express cars; 1,844 freight cars and 6 service cars.

The general account, condensed, is as follows:

Capital stock		$2,500,000
Bonds		1,242,000
Notes payable		441,300
Accounts and balances		83,674
Profit and loss		237,731
Improvement account		80,533
Total		$4,585,238
Road and equipment	$4,250,000	
Materials	108,060	
Accounts and bills receivable	10,196	
Cash	216,982	
		$4,585,238

There was no change in stock and bonds; bills payable were reduced $71,000 in amount during the year.

The earnings for the year were as follows:

	1884-85.	1883-84.	Inc. or Dec.	P. c.
Freight	$504,335	$667,607	D. $73,272	11.0
Pass-ngers	428,079	441,678	D. 13,599	3 1
Mails, etc.	54,753	27,348	I. 27,405	100.2
Total	$1,077,167	$1,136,633	D. $59,466	5.2
Expenses	755,659	869,901	D. 114,242	13.1
Net earnings	$321,508	$266,732	I. $54,776	20.5
Gross earn. per mile.	21,368	22,548	D. 1,180	5 2
Net " "	6,378	5,291	I. 1,087	20 5
Per cent. of exps	70.2	76.5	D. 6.3	....

Expenses include taxes and rent of Worcester union station. The reduction in earnings was chiefly due to lower rates received on freight, as shown below.

The result of the year was as follows:

Net earnings, as above		$321,508
Interest account, balance	$90,975	
Dividends, 6 per cent	150,000	
		240,975
Surplus for the year		$80,533
Notes payable paid, etc	$71,159	
Increase in cash and materials	9,374	
		80,533

All improvements, including the station and yard at Valley Falls, rebuilding bridges, new second track, etc., were charged to expenses.

The traffic for the year was as follows:

Train miles:	1884-85.	1883-84.	Inc. or Dec.	P. c.
Passenger	286,631	290,109	D. 3,478	1.2
Freight	244,729	252,995	D. 8,266	3.3
Service and switch.	207,887	221,123	D. 13,236	6.0
Total	739,247	764,227	D. 24,980	3.3
Passengers carried	2,561,618	2,587,798	D. 26,180	1.0
Passenger miles	20,429,299	20,757,058	D. 327,759	1.5
Tons freight carried	828,861	762,243	I. 66,618	8.7
Ton-miles	24,161,818	21,596,979	I. 2,564,839	11.9
Av. train load:				
Passengers, No	71.3	72.0	D. 0.7	1.0
Freight, tons	98.7	85.0	I. 13.7	16 1
Av. rate:				
Per passenger-mile	2.08 cts.	2.12 cts.	D. 0.04 ct.	1.9
Per ton-mile	2.45 "	3.09 "	D. 0.64 "	21.0

Locomotives ran 1.39 miles for each revenue train mile last year, the proportion of switching mileage being large.

The report says: "There have been no charges made to property account this year; but at the directors' meeting in August it was unanimously voted to close the construction account after reducing it to a net of $3,500,000, by charging off to profit and loss and crediting to construction the amount in excess of that sum that stood charged to construction on the books at the close of the fiscal year; and also to close the equipment accounts after reducing them to a net of $750,000, in the same manner as the construction account. In accordance with this vote there was charged off to profit and loss $200,264 and a like amount credited, $8,628 to construction, and $191,636 to cars and locomotives.

"The balance of $80,533, or surplus remaining for the year after paying all charges for interest and dividends, has been put into an improvement fund, to be expended as the directors may order in the future."